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ABSTRACT

This guide describes 38 activities appropriate for grades K-12. Each activity contains a brief description of the activity and a list of materials needed. The second section of the guide contains environmental learning games to be played in the classroom. These games include: crossword puzzles, cryptograms, logic problems, card games, and find-a-words. All of the games listed may be reproduced. There is a list of free materials available on trees, wood products, and paper making. (AJ)

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ENVIRONMENTAL STUDIES PROGRAM

ACTIVITIES IN ENVIRONMENTAL EDUCATION

EPD CONSORTIUM D

SE 022 619

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A C T I V I T I E S

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E N V I R O N M E N T A L E D U C A T I O N

by
Michael Owens

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Dr. Billy N. Pope, Project Director
Mike Owens, Project Facilitator
Educational Personnel Development Consortium D

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During 1976-77 Environmental Studies Program used the facilities of the Richardson Independent School District to conduct inservice for teachers and develop instructional strategies for use with students. The teachers participating in the development and validation of activities found in this guide were:

Berkner High School	Katherine Goodbar Cathy Miller
J. J. Pearce High School	Mary McBride
Richardson High School	Ginger Mayo
Lake Highland High School	Windy Windstead
Forest Meadow Junior High School	Richard Bass
Lake Highlands Junior High School	Vicki Keathley Lane Peters
Liberty Junior High School	Sally Fox
Northwood Junior High School	Yvonne Nickerson Jim Stephens
Richardson Junior High School	Ron Studdert Kathy Wohlgehagen
Richardson West Junior High School	Diane Stephens
Westwood Junior High School	Charlotte Klenk
James Bowie Elementary	Nancy McDaniel Roger Renfro
Dartmouth Elementary	Mary Baird
Greenwood Hills Elementary	Maxine Daniel
Mark Twain Elementary	Donnie Ickles
Spring Creek Elementary	Janice Clevenger Neal Frindell Bonnie Mitchell
Terrace Elementary	Jennie Vahrenkamp

Special thanks go to Mr. David Olson, the Secondary Science Consultant for the Richardson schools, and Mr. Gene Peer, leader of Team C Elementary Consultants for Richardson schools. It is only through the efforts of Gene and David that this project was able to meet and exceed its goals and objectives. Environmental education needs the dedicated leadership of administrative and support staff to be able to meet the educational needs of children of the future.

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Description
Project ESP Environmental Studies Program

Project ESP proposed to provide environmental education resources to teachers in the 49 Texas counties that make up Educational Personnel Development Consortium D. During the year 1976-77, the project involved the Richardson Independent School District in Dallas County, Texas, in the development of a model for school districts development of environmental education curricula and for involvment by the school faculty in environmental education concepts. The plan was to incorporate awareness on the part of a large audience and select the most interested persons to participate in the curriculum development phase. The curriculum developers are to act as multipliers providing inservice education in their buildings and within the local school systems as well as other schools in the consortium.

The local school district participated in the writing of the proposal and undertook the original awareness before the funding of the project. The awareness was a series of workshops led by the local science coordinator. The initial workshop was a three-day interaction held at the school's environmental study site and the administration building. The workshop was designed to provide teachers with skills and confidence in working in the environment. To provide these skills the resources of the State Water Quality Board, the State Parks and Wildlife Department, the local soil conservation office, and the State Forestry Service were secured. Each agency provided a consultant that conducted a half-day's activity divided between field work on site and inside work done at the administration building. The third day was a workshop held by an outside consultant in the use and design of the Outdoor Biological Instructional Strategies (OBIS) materials and a Texas product, the Harris County environmental guides, were displayed. The project facilitator assembled a packet of resource materials from state and federal agencies of over 60 items

that were given to the teachers. There was time for teachers to participate in development of bulletin boards and learning centers. The resources that were available were all free from state or federal sources. The participants were asked to volunteer to participate in the curriculum development phase of the project and 24 persons were identified. A subsequent inservice was held during the two days before school, where new teachers and others were informed of the curriculum development opportunities and given basic awareness of the need to incorporate environmental concepts in their teaching. Of a total of 30 volunteers, 24 were able to make the final commitment to assist in curriculum materials. The products of their work are the contents of this report.

The 24 participants were involved in ten days of inservice. The inservice days were separated by one or more weeks and lasted from September until March. Each inservice was designed to meet specific needs and included representatives of commercial materials, local museum curators, specialists in environmental science, and opportunities for field trips to environmental resource areas. The participants were placed in groups early in the inservice and given the task of designing instructional materials for use in their class. The materials were revised and field tested and presented for circulation within the district as a model environmental unit. The materials developed included slide stories on school environmental sites, learning centers, learning packets, and total mini courses of instructional materials. The products are by-and-large specific to local needs and not available for distribution. This guide is designed to disseminate the information from the project that has the greatest appeal and impact on environmental education.

The model used in Project ESP was most successful and is recommended for any one school district trying to infuse environmental stewardship in the curriculum. The concepts of limited natural resources, the interdependency

of all living and nonliving systems on the energy matrix, were illustrated by the participants. Environmental education linked with active use of the on-school site and a natural area set aside for students to observe the natural changes were the most successful. It is important if educators expect children to appreciate the dynamics of change to provide them a platform as observers of this change rather than the constant turmoil they experience as being in change. It is seldom in an urban school that a child attends grades K-6 at one school with one teacher in one room. Therefore, it is imperative that a "same" place be provided, such as an environmental study center where children are allowed to observe one place over the years and to note the natural changes. Environmental education continues to be a pressing concern for the public and the school in that the unborn society of tomorrow must live with the decisions of the dying generation of today.

TRIED & TRUE

Descriptions of Activities

Inside and Outside

Done By ESP Participants

Title: Bug 300 (an alternative to insect collections)
Used by Vicki Keathley Lake Highlands Junior High School Grade level 7-12
Spring 1976 3 classes Indoor

Appropriate grade levels 7-12

Describe activity: The materials are used to make cages for live insects (construction is explained on the back). Adult insects such as crickets, grasshoppers, preying mantis and beetles are brought by the students and placed in cages (cages are labeled as to name and location caught). Students are responsible for feeding the insects and deciding when to let them go, etc. Another section of the zoo is labeled the "Baby" zoo. In these cages we had cocoons, pupas, and egg cases the students found (also caterpillars). They were watched over the weeks until they "hatched." The caterpillars had to be supplied with their particular food almost daily, so it is essential that the student bringing them in, know the type of plant source they were found on.

Material Used: Wire screen, coffee cans, wire, hacksaw or metal cutter or old stockings and 1/2 pt. or pt. milk cartons.

Difficulties: There may be some difficulty in finding space in your room for the cages, and a few minutes will be needed each day for the students to take care of the insects. Also some insects do not do well and will have to be released. Many days will be uneventful, but on that "Tuesday" the green caterpillars start spinning their cocoons or that "Friday" a moth emerges from a pupa it will all be worthwhile. The day I had 300 1/2 inch preying mantis' emerge was tremendous. Every child got to hold one and then let it go out of the window. You may want to do this strictly for showing the different types of metamorphosis and leave out the adult insects. But many, such as the preying mantis are very interesting to a child. (Hemiptera's are hard to keep for more than a day or so)

Construction of cages: You will need any size coffee can with the plastic lid. (I prefer the 1 pound) These will have to be cut in half (crosswise) with the hacksaw. Hint-this is not an easy job. I recommend students bring already cut cans from home. The rough edges of the can should be covered with tape or wax as they can really be sharp. The wire should be rolled into a 1 foot long cylinder, with a diameter the same as the diameter of the can (wire the screen together). Then place the top and bottom of the can on the ends of the cylinder and place upright. The insects are released into the cage through the plastic lid. An easier method for insect cages, is to cut 2 sides out of a 1/2 pt. or pt. milk carton and slip it into an old stocking. The stocking will be tight against the carton, so the insects stay in the carton.

Title: Mapping a Study Site
Used by Janice Clevenger | Spring Creek Elem. | OBIS I | Grade 6
Oct. 1 and 4, 1976 | 25 Students | Outdoor

Appropriate grade levels 4-9

Describe activity: This is designed to allow students to map major features of an outdoor site. We used a creek area across from the school. Students were divided into groups and were assigned different quadrants as suggested in the instructions. Color codes were established for different features found. Groups then compiled their facts and created 1 large map for general classroom use.

Materials Used: Meter stick, string remeasured to 10 m., data board, pencils, marking pens

Title: Mural on Pollution
Used by Cathy Miller | Berkner High School | Grade-High School
Jan. 19-Feb. 1 | 163 Students | Indoor

Appropriate grade levels K-12

Describe activity: Told students to creatively portray pollution on the mural by pictures or letters.

Materials Used: Marks-a-lots, butcher paper

Title: Community Activity Card
Used by Cathy Miller | Berkner High School | Essence II
Jan. 19-22 | 35 Students | Indoor

Appropriate grade levels 7-12

Describe activity: Read card to Students: Make different sounds in different situations-Record your reactions.

Title: Genetics Mystery Game
Used by Lane Peters | Lake Highlands Junior High School | Grade 7
Dec. 15, 1976 | 90 Students | Indoor

Appropriate grade levels 7

Describe activity: Kids are in groups and together decide the genotype of the people and decide who is Mr. Jones' real child.

Material Used: Heredity Mystery

Title: OBIS Invent An Animal-Adaptation
Used by Donnie Ickles Mark Twain Elementary Grade Level 6th
Nov. 29/ Dec. 3, 1976 23 Students OBIS I Indoor and Outdoor

Appropriate grade levels 4-7

Describe activity: Each student was to invent an animal and camouflage it. They had reviewed a National Geographic filmstrip on animals and their habitats before doing this activity. Each student constructed his animal, painted it and was sent out ot "hide" his animal. All the class went out to find as many animals as they could, collect them and return to the room. The students whose animals were not collected proved their animal could survive in the habitat.

Difficulties: Some students were slow in finishing their animals and had to take them home to finish them. The paper mache is not recommended unless you have plenty of time.

Material Used: Potatoes, carrots, paper mache (newspaper-wheatpaste), paint, wire, glue, tape, popsicle sticks.

Title: Bethlehem Steel Booklet-"Steelmaking and the Environment"
Used by Donnie L. Ickles Mark Twain Elementary Grade Level 6th
Dec. 8/Dec. 17, 1976 23 Students Others Indoor

Appropriate grade levels 3-8

Describe activity: I put the white butcher paper on a long chalkboard in my classroom with the statement "Pollution is a dirty word" painted on it. I asked the students to draw a picture using the word pollution in their picture. I asked them to think about what comes into their minds when they heard the word pollution. After thinking they went to the board to draw what they felt about pollution.

Materials Used: Long strip of white butcher paper for mural. Crayons, felt pens, tempera paint, and pastel chalk.

Title: Setting Up On-School Environmental Site
Used by Jennie Vahrenkamp Terrace Elementary Grade Level 6th
88 Students Outdoor

Appropriate grade levels 4-12

Describe activity: The students and teacher decided on a site on the school grounds. The reasons for setting up a site and what was to be observed was discussed before actually going out. The children measured the plot which is 20 X 20. This area is divided into 3 parts. One part will be roto tilled, one section mowed, and one section left in its natural state. The students will observe the changes of the 3 sections.

Material Used: Stakes, flags for stakes, tape for measuring

Title: Activity
Used by Lane Peters | Lake Highlands Jr. High | Grade Level 6-9
April, 1977 | 90 Students | Indoor

Appropriate grade levels 6-9

Describe activity: Students create art object (picture, jewelry, covering box or bottle) with seeds of different types. Include with the project a key identifying the various seeds and how they disperse. Students are asked to use unusual seeds. They may so outside to collect some of their seeds.

Title: Organism Interaction
Used by Janice Clevenger | Spring Creek Elem. | Grade Level
October 22, 1976 | 25 Students | Indoor

Appropriate grade levels 4-8

Describe activity: A set of animal drawings was used to develop students ideas and knowledge of animals. "Who Am I" game played as well as the activity illustrating food web.

Material Used: Organism Interaction cards, Yarn (red and green)

Title: Food Chain Game
Used by: Maxine Daniel | Greenwood Hills Elem. | R.I.S.D. | Grade 4
Oct. 14, 1976 | 28 Students | Outdoor

Appropriate grade 5

Describe activity: After discussing the food chain concept in the classroom, we selected several children to be parts in the food chain of a community. We discribed three different types of disasters and each time the illustration revealed how the world community was affected.

Materials Used. Yarn (for Chain)

Title: Making Pangaea
Used by Vicki Keathley | Lake Highlands Junior High School | Grade Level-8
January, 1977 | 5 classes | Indoor

Describe activity: Each child colors in the large mt. ranges of each continent, then cuts out all the large continents, etc. Then they glue them together (puzzle like) on the plain paper the way they think they might have been. Next show them the versions of the experts.

Materials Used: large copies of world maps. 1 per student, color pencils, glue, plain paper, scissors

Difficulties: Finding the right map. They can be ordered through the Dist. or borrowed from your history dept.

How could it be done differently? They could be put in groups (5 or so) and each group given a diagram of the way the continents looked at different times. Each group constructs their map for that time. Then all maps are held up for the class to let the students try to figure out the correct order (in time) of the map. The concept of the super continent and continental drift can be effectively taught in a fun and involved way.

Title: Group Posters or Graffiti Boards
Used by Vicki Keathley | Lake Highland Jr. High | Indoor
November | 150-5 Classes

Appropriate grade levels 8-12

Describe activity: Each student is to express himself either by words or pictures on the butcher paper about a given subject. I chose "The Farth". Some jotted down facts, sayings, (original or otherwise) poems, thoughts, and feelings about the Earth. (Out of 5 classes only a few negative things were said-mostly about the pollution). It gave the kids the chance to use facts they had learned, it lets them express themselves and it also raises questions!! Afterwards I displayed the posters (which were very colorful) on the walls outside my class room. Many other students stopped to read them and a few who were not in my class added their comments.

Materials Used: Butcher paper, crayons, markers. This can be done in groups or as a class, I prefer as a class.

Title: Recognizing Rock Forms
Used by Bonnie Mitchell | Spring Creek Elem. | R.I.S.D. | Grade 4
Sept. 23, 1976 | 23 Students | Indoor

Appropriate for grade levels 4

Describe activity: Children examined the rocks: described each one; noted color, texture, feel, hardness, sheen, odor, etc.

What materials used: Set of rocks, Books on rocks, hand lens

Title: Mapping a Study Site
Used by Janice Clevenger | Spring Creek Elem. | OBIS I | Grade 6
Oct. 1 & 4, 1976 | 25 Students | Indoor and Outdoor

Appropriate grade levels 4-9

Describe activity: This is designed to allow students to map major features of an outdoor site.

Materials Used: Meter stick, string premeasured to 10 m., data board, pencils, marking pens

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Title: OBIS Oil Spill
Used by Yvonne Nickerson | Northwood Jr. Hi. | OBIS II | Grade 8
Sept. 17, 1976 | 25 students | Outdoor

Appropriate for grade level 6-8

Describe activity: Oil Spill Situation Activity - Done at a stream or ocean site - Teachers or leader throws popcorn into stream- class has been divided into pairs (buddies) or teams to study. Landscape Impact, Plant Life Impact, Animal Life, Human Activities - 4 major impact groups. Each group or pair is given a card with a set of questions about their impact area.

What material used: Popcorn 33¢

Title: Plant Patterns

Used by Katherine Goodhar	Berkner High	OBIS I
Sept. 16, 1976	31 Students	Outdoor

Appropriate for grade levels 6-8

Describe activity: Activity took place in a field across from school unmanaged. Followed directions exactly from OBiS I.

What materials used: Squares of gummed paper with data made with felt tip pen. Cardboard covered with paper.

Title: Metric Caper OBIS

Used by Lane Peters	Lake Highland Jr. Hi.	OBIS II Grade 6-9
Sept. 17, 1976	90 Students	Indoor

Appropriate grade level 6-9

Describe activity: Measurements in volume, temperature, length, and weight by teams. Each team comes up with a mystery number (all measurements added together). Other teams try to guess this mystery number.

What Material used: Metric caper. Refer to OBIS for materials, Meter sticks can be used. For circular measurements yarn or string can be used.

Title: Space Laughs

Used by Vicki Keathley	Lake Highlands Jr. High	Grade 8
October 13, 1976	140 students	Indoor

Appropriate grade levels 8-12

Describe activity: Students in groups of 3 are to make up a cartoon about space objects, space motion, etc. They must be factual. They work in groups and draw up their cartoon. Afterwards students present their cartoons to the class students evaluate each for cleverness, Factuality, neatness. Students usually were able to pick out falacies quickly. The best can be displayed. This is also a good idea for students who are constantly asking for extra credit activities. This is just one more way of repeating material to students. I feel like I bore them by giving them the same material again, but yet I know they don't know it yet. Also let them use their information rather than just feeding it back. I was very impressed with their cartoon. They were much better than I expected. Having examples is very helpful to get them started. My favorite:

Frame 1-2 Linus and Charlie Brown are talking - Linus admits that (while looking at Jupiter through his telescope) the plant reminds him of his Aunt Bertha.

Frame 3 Because they're both the biggest in the bunch.

Materials Used: Large piece of manilla paper, crayons, black felt tip pen

Title: Birdfeeder
Used by Maxine Daniel — Greenwood Hills Elem. — OBIS II Grade 4
Sept. 18-20, 1976 — 28 Students — Indoor and Outdoor

Appropriate grade levels 4-8

Describe activity: After discussion of birds and habits, we talked about the type of results we might expect from experimenting. Each child built his own bird feeder by cutting out three sides of a gallon milk carton and nailing it to a 5' or 6' stick. These were put in their own yard for the weekend. In addition each one had a group of at least 4 activity cards to make observation reports. Bird models were made of construction paper: red, blue, brown and black. During the period of observations different models were attached to the feeder to observe what type birds were attracted or any change as a result of changing models. Another experiment used was the attachment of cat eyes to the side to observe reaction of birds.

One suggestion I would make is to have a feeder placed outside the school window for continuing the project. This would help those students who were unable to take part or who had bad results on the first project.

Materials used: Gal. Milk cartons, bird food, sticks, tacks, pattern for bird and cat eyes.

Title: St. Regis Poster
Used by: Sally Fox — Liberty Jr. High — Grade 7
Date: Continually — Indoor

Appropriate grade levels 3-12

Describe Activity: Included illustrations in plant unit, about 40 posters are available covering plant growth and development.

Materials used: St. Regis Posters are available from:

St. Regis Paper Co.
150 East 42nd Street
New York, N.Y. 10017

Title: Licken Looking
Used by Ron Studdert — Richardson Jr. Hi.
Sept. 12, 1976 — 18 Students — Outdoor — Grade 9

Appropriate for grade levels 9

Describe Activity: Licken hunting

What material used:

Title: Invent An Animal Adaptation
Used by Jennie Vahrenkamp | Terrace Elem. | OBIS I | Grade 6
Sept. 17-23, 1976 | 30 students | Outdoor

Appropriate for grade levels 5-12

Describe activity: The children invented animals and took them outside to hide them. The children try to show how animals are camouflaged in order to adapt to its habitat to survive and reproduce. The activity showed the children that when animals are well adapted to the environment their chances for survival and reproduction are greater.

What material used: Potatoes, celery, carrots, paint, popsicle sticks, glue, rice, tape, pipe cleaners.

Title: Transpiration in plants moisture makers
Used by Cathy Miller | Berkner High School | OBIS I Grade Senior
Sept. 19, 1976 | 16 Students | Indoor and Outdoor

Appropriate grade levels 7-8

Describe activity: Some students went outdoors, others stayed indoors. We got conficting data as upper vs lower sides & small vs large leaf. Suggestions-Do not attempt this activity if it has rained recently as it will cause gross experimental error. If it is done indoors, pick several varieties of plants.

What material used: CoCl paper, plants, baggies, tape. Keep CoCl paper carefully stored in plastic baggies as it will turn befor the experiment if are is humid.

Title: Change in the Environment
Used by: Maxine Daniel | Greenwood Hills Elem. | Grade 4
Oct. 9, 1976 | 28 students | Indoor and Outdoor

Appropriate grade

Describe Activity: Student took a pencil and paper outdoors, recorded as many changes as they could going on. Very high interest. Good preparation in classroom before going out is vital. My students worked on an individual basic and we stayed out about 30 minutes. They were given the boundry limits and instructed to write down, draw or bring back evidence of change. Participation was good and all brought good report back to class for follow up. As a follow up activity we planned a time capsule to place a small personal capsule for each child. Inside each capsule the child places such things as their weight, height, shoe size, address, hair sample, likes and dislikes list (food etc), sample of handwriting, art, members of family, other ideas plus a picture of each one.

Materials Used: Book Science on a Shoestring by Addison Wesley

Title: Hopper Circus
Used by Richard H. Bass | Forest Meadow Jr. Hi. | OBIS II | Grade 7-8
Sept. 22-24, 1976 | 120 + Students | Outdoor

Appropriate for grade levels 6-8

Describe activity: The students in each class were organized into work groups of 3 or 4. We went into a vacant, weed covered field and collected grasshoppers, katydid, or crickets. The nect day we used the "side show" cards and each student recorded the results and reported to the rest of the class. The high light was the hopper race. Very successful.

Materials Needed: Sweep nets are needed. A 1/2 gal. or 1 gal. waxed cardboard milk carton for every two or three students.

Title: Natural Recycling in Water
Used by Kathy Wohlgehagen | Richardson Jr. Hi. | OBIS I | Grade 7 Honors
Sept. 16, 1976 | 24 Students | Indoor

Appropriate for grade levels 4-7

Describe activity: Put some peelings in each bag - weigh and submerge in an aquatic environment. Remove, reweigh, and observe at specific times.

Material used: Vegetable peelings, mesh bag, plastic bag, used nylon stocking, aquatic environment.

Title: Sound Off
Used by Neal Frindell | Spring Creek Elem. | OBIS II | Grade 6
Sept. 17, 1976 | 24 Students | Outdoor

Appropriate for grade levels 4-6

Describe activity: Each student puts a bag over his head and is given a noisemaker. Each student is to find the person with a similiar noismaker before he is caught by a predator who had a distinct noisemeker. Number of predators and of each animal can and should vary.

What material used: Paper bags, sets of sound makers (borrowed from music room they have a wide variety of different sounds.)

Title: Population of Community
Used by: Dianne Stephens | Richardson West Jr. High | R.I.S.D. | Grade 7
October (end of month) | 28 Students | Indoor

Appropriate grade levels 7-8

Describe activity: Determine from census reports community size since 1900. Determine birth and death rate from local obituary and birth announcements.

Materials used: Richardson Daily News-Posted in room, Graph Paper, Ditto for bar graph

Title: Plants Around A Building (OBIS I)

Used by Ginger Mayo	Richardson High	OBIS I	Grade 7-10
Sept. 20, 1976	45 Students	Outdoor	

Appropriate for grade levels 7-10

Describe activity:

Purpose: To discover how the conditions around a building affect the growth of plants.

Preparation:

1) Select a building site for the activity.
2) Prepare outline maps of the building for each team of students. Also prepare a large outline map for charting the final results. The map should show only the outline of the building and any significant structures nearby.
3) Prepare action cards so each team will have a card.

Procedure:

1) Divide the group into teams of two to four.
2) Distibute outline maps and explain the orientation points of the map.
3) Pass out an action card to each group. Tell the groups to find as many examples as they can of the situation described on the card. Each group should mark the situations found on their individual map.
4) Allow fifteen or twenty minutes for observation. When the groups come back, have them transfer their findings to the larger master map using different colored pencils for each group.
5) Alter the results have been recorded, discuss what might have caused the situations that were observed.

Suggestions for the Action Cards

1) Find plants that seem to grow much larger than the same kind of plant in other places around the building.
2) Find areas where plants are growing much smaller than similar plants around the building.
3) Find an area where the number of plants in a small area is high.
4) Find an area where the number of plants in a small area is small.
5) Find areas where no plants are growing.
6) Find the least common plant growing around the building. Are there any special conditions which permit it to grow in that place or places?
7) Find the most common plant or plants growing around the building. What do you think is the reason for it?

Other Suggested Activities

1) Select an environmental variable (temperature, moisture, light, wind, etc.) and tour the site observing how plants respond to the variable.
2) Orient the outline map according to the compass, and have the students hunt for eveidence of differences in plant growth on the north, south, east, and west side of the building.
3) Can the effects of gardening or a lack of it account for growth differences?

What materials used: Action cards (provided in exercise) Outline maps of building.

Title: Mapping A Study Site
Used by Nancy McDaniel | Bowie Elem. R.I.S.D. | OBIS I | Grade 6
Sept. 17, 1976 | 35 Students | Indoor and Outdoor

Appropriate for grade levels 3-7

Describe activity: 1) Discussed predators and predatory devices 2) Discussed specifics of how they are used and which animals we know are predators 3) Gave out action card with device they are to make 4) They were assigned to decide on a specific animal which the action card would fit 5) They made their original predator devices (some make 2 for those predators with 2 basic devices) Took longer than I expected-some are still working on these 6) They learned some basic predator device or devices that their animal uses 7) They shared their devices with the class.

What material used: 1) tongue depressors 2) scotch tape 3) construction paper 4) wire (small and large) 5) small twigs and limbs 6) rubber bands 7) yarn 8) string 9) pipe cleaners 10) pins 11) brads 12) cardboard 13) paper towel rolls 14) popsicle sticks 15) masking tape 16) paper clips 17) soap etc.

Title: Mapping A Study Site
Used by Donnie L. Ickles | Mark Twain Elem. | OBIS I | Grade 6
Sept. 16,17, & 20 | 23 Students | Indoor and Outdoor

Appropriate for grade levels 5-8

Describe activity: This activity is designed to allow students to map the major features of an outdoor site on their school campus.

The class was divided into four groups. Each group was given one data-board section of the map of our outdoor study site. All the groups were then instructed to go into the field to explore and map their areas showing: trees, bushes, grasses, dead trees, logs, weed beds, ant colonies, animals burrows, and bird nest.

What materials used: 1) 4 data boards 2) 2 boxed of crayons 3) 1 marking pen (per group) 4) drawing pencils-#3

Title: Invent A Plant Adaptation
Used by Bonnie Mitchell | Spring Creek Elem. | OBIS I | Grade
Sept. 16, 1976. | 23 Students | Indoor

Appropriate for grade levels 4-12

Describe activity: Children invent a plant for certain adaptation. Draw the plant, then bend the wire as designed. Dip the wire in plastic, then put the parts together with floral tape.

What material used: Fun film, wire, floral tape, scissors

Title: Change in the Enviroment
Used by Donnie Ickles | Mark Twain Elem. | Grade 6
Oct. 22, 1976 | 23 Students | Outdoor

Appropriate grade levels 4-7

Describe activity: I prpared my class by having a class discussion about changes that take place in our environment. For an example, we discussed changes which have taken place in our school environment. The students were instructed to go out to our school environmental site to record changes that have taken place. They returned to the class and wrote reports on their observations.

Materials used: Pencils or pens, paper (notebook & manila), crayolas or map pencils.

Title. Adaptation - Predator - Prey
Used by Nancy McDaniel | Bowie Elem. R.I.S.D. | OBIS I | Grade 6
Sept. 17, 1976 | 35 Students | Indoor and Outdoor

Appropriate for grade levels 3-7

Describe activity: 1)Discussed predators and predator devices 2)Discussed specifics of how they are used & which animals we know are predators 3)Gave out action card with device they are to make 4)They were assigned to decide on a specific animal which the action card would fit 5)They made their orginal predator devices (some made 2 for those predators with 2 basic devices) Took longer that I expected-some are still working on these 6)They learned some basic predator device or devices that their animal uses 7)They shared their devices with the class. (This activity can't be done without securing OBIS I Kit to secure action card titles)

What materials used: 1)tongue depressors 2)scotch tape 3)construction paper 4)wire (small & large) 5)small twigs & limbs 6)rubber bands 7)yarn 8)string 9)pipe cleaners 10)pins 11)brads 12)cardboard 13)paper towel rolls 14)popsicle sticks 15)masking tape 16)paper clips 17)soap, etc.

Title: Natural Recycling in Soil
Used by Charlotte Klenk | Westwood Jr. High | OBIS I | Grade 8
Sept 1976 | Outdoor

Appropriate grade 5-8

Describe activity: Put garbage in each of the three bags and weigh each. Then bury each bag at the same depth and leave a lone about 2 weeks. Dig up and weigh.

Material Used: Plastic bag, netting, nylon, hose, garbage, string, digging tools

23

Title: Bean Bugs

Used by Janice Clevenger	Spring Creek Elem.	OBIS I	Grade 6
Sept. 17, 1976	24 Students	Outdoor	

Appropriate for grade levels 5-9

Describe activity: This activity is suggested for use in estimating populations of organisms too numerous to count. The census is conducted by a quadrat technique. Beans are distributed over a prescribed area and students are asked to calculate number of organisms by taking random samples, finding an average and then estimating number in the prescribed area.

What materials used: 1) one pound bean bugs 2) meter stick 3) string 4) 4 large nails 5) wire quadrat 1 dec. x 1 dec. square

Title: Water Breathers

Used by Sally Fox	Liberty Jr. High	OBIS II
Sept. 16, 1976	29 Students	Indoor

Appropriate for grade level 5-7

Describe activity: Each group of 4 students had beaker with water containing 1 aquatic animal (crawfish, tadpole, tropical fish, etc.) which had been brought by students the day before. Dropping 1 or 2 drops of food coloring to indicate various invisible current set up by animal.

What material used: 400 ml beakers, hand lenses (10x) food coloring, dropping pipettes

Title: Invent an Animal Adaptation
Used by Nancy McDaniel | James Bowie Elementary | Grade Level 6
November 19, 1976 | 35 Students | OBIS I | Outdoor

Appropriate grade levels 3-6

Describe activity: To make an animal that can't be found by hiding it in its habitat. Their camouflage should have kept their animals from being found.

Material Used: Paint, glue, potatoes, wire, yarn, pipe cleaners, beans, carrots, etc. - all types of odds and ends.

Title: Invent a Plant
Used by Nancy McDaniel | James Bowie Elementary | Grade Level 6
December 8, 1976 | 35 Students | OBIS I | Indoor

Appropriate grade levels 4-6

Describe activity: Students were to make a model of a plant that showed the basic things that made it adapt to its natural habitat.

Material Used: Paper, wire, pipe cleaners, tape

Title: Roots and Shoots
Used by Nancy McDaniel | James Bowie Elementary | Grade Level 6
February 2, 1977 | 35 Students | OBIS II

Appropriate grade levels 4-7

Describe activity: Divided into groups of five - class had to see if they can match.

Material Used: Weeds from outside, roots

Title: Lichen Looking
Used by Nancy McDaniel | James Bowie Elementary | Grade Level 6
January 26, 1977 | 35 Students | OBIS II | Outdoor

Appropriate grade levels 4-8

Describe activity: Went over what we were to look for - groups of three - They were to see how many types of lichens we could find.

Material Used: Trees outside the school building, pencil and paper

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Title: Metric Capers
Used by Nancy McDaniel | James Bowie Elementary | Grade Level 6
January 19, 1977 | 35 Students | OBIS II

Appropriate grade levels 5-7

Describe activity: Measured common outdoor items by regular measurement and by metrics.

Material Used: Metric rulers and sticks, plants, other things from outdoors

Title: School Population Study
Used by Charlotte Klenk | Westwood Junior High | Grade level 8th
February 21, 1977 | 139 Students | Indoor

Appropriate grade levels 7-12

Describe activity: Draw graph of school population and anticipated trend. Then do discussion questions.

Material Used: Supplemental Activities Guide to Environmental Science-RISD by Campanella, Goodbar, McBride

Title: Discovering the Unique Properties of Water
Used by Charlotte Klenk | Westwood Junior High | Grade level 8th
February 21, 1977 | 34 Students | Indoor

Appropriate grade levels 7-12

Describe activity: Detecting calcium and magnesium salts in the water, by desolving $Ca(OH)_2$ in water then letting the salt settle out. Then adding Na_2CO_3 for removing additional calium ions.

Materials Used: Supplemental Activities Guide to Environmental Science - RISD by Campanella, Goodbar, McBride

Title: Ways to Identify Rock-forming Minerals by Characteristics
Used by Charlotte Klenk | Westwood Junior High | Grade level 8th
January 31, 1977 through February 5, 1977 | 175 Students | Indoor

Appropriate grade levels 8-12

Describe activity: Taking one mineral test for all its physical and chemical properties

Materials Used: Supplemental Activities Guide to Environmental Science - RISD by Campanella, Goodbar, McBride

Title: Recognizing Igneous, Sedimentary, and Metamorphic Rock
Used by: Charlotte Klenk | Westwood Junior High | Grade level 8th
February 7, 1977 through February 18, 1977 | 175 Students | Indoor

Appropriate grade levels 8-12

Describe activity: To identify rocks by composition and texture.

Materials Used: Supplemental Activities Guide to Environmental Science - RISD by Campanella, Goodbar, McBride

Development of a Modified Outdoor School Site (Aquatic)

by Cathy Miller, Berkner High School

I. Materials List:
- Plastic containers of equal size
- Pond water
- Tap water
- Microscope
- Slides
- Coverglass
- Dropping pipettes
- pH paper
- Thermometer
- Petri dishes
- Agar
- Inocupating loops
- Autoclave
- Chemicals
- D.O. kits
- Ion kits

II. Procedure
- A. Get permission to excavate from building principal
- B. Excavate the site and bury two containers in an enclosed area (i.e. courtyard) and two containers in an exposed area
- C. Fill one container in each location with tap water and one container in each location with pond H2O
- D. Procedure from the point will vary according to the various parts of the exercise undertaken

III. Suggested projects
- A. Relationship between temp, pH, and algae growth
- B. Relationship between temp, pH, and protozoan growth
- C. Relationship between dissolved oxygen and temperature
- D. Relationship between dissolved oxygen and animal life
- E. Relationship between dissolved oxygen and plant life
- F. Ion changes over time
- G. Ion differences between tap water and pond water
- H. Algae taxonomy studies
- I. Protozoan tazonomy studies
- J. Bacteria studies (Planting, identification of major group types, isolation techiques, straining, etc.)

IV. Feedback - key log of input by students and any other teachers for future adaptation and exaluation

LEARNING GAMES

For you to duplicate and use.

Any of the following games may be reproduced for use with students.

POLLUTANTS PUZZLE

This puzzle could be used in a variety of ways.

1. The puzzle could just be handed to the students to find any words that deal with pollutants.

2. The student could be given a list of words to find in the puzzle.

3. The students might be given a list of the definitions and be told to find the word after matching them with the definitions.

4. They might be given the words and be asked to define them first and then find them on the puzzle.

NOTE: THE WORDS ARE ARRANGED ACROSS, UP, DOWN, DIAGONAL AND BACKWARD.

POLLUTANTS

T N E X G O M I S T Z Q E G A W E S
S I W D H E A V Y M E T A L S X W Y
C T Z S I Q S E D I C I B R E H G N
I R H F W X K S X H W G S O Z U S E
T O S D S N O B R A C O R D Y H E R
S G A H P C Z N F Z D F W O K O D G
A E O S C X T D O E N Z H R X N I I
L N W D B G Z Q D M K O B S D O X S
P O Y K S E W E W D N D T F Q I O M
A X R B Q H S E D I R O U L F S R O
O I U F Z I N T B O I L B S B O U K
K D C W O D S M O G X A M R T R F E
H E R N Q E Z A M S K O N W A E L Z
S S E T A H P S O H P C Z G X C U F
A Z M Z W P A R T I C U L A T E S X

1. DDT
2. Ash
3. Carbon monoxide
4. Hydrocarbons
5. Nitrogen oxides
6. Sulfur oxides
7. Particulates
8. Fluorides
9. Asbestos
10. Heavy metals
11. Fog
12. Haze
13. Smaze
14. Synergism
15. Smoke
16. Dust
17. Smog
18. PCBS
19. Mist
20. Noise
21. Herbicides
22. Coal
23. Odors
24. Mercury
25. Lead
26. Phosphates
27. Sewage
28. Erosion
29. Oil
30. Plastics

30

POLLUTANTS

T N E X G O M I S T Z Q E G A W E S

S I W D H E A V Y M E T A L S X W Y

C T Z S I Q S E D I C I B R E H G N

I R H F W X K S X H W G S O Z U S E

T O S D S N O B R A C O R D Y H E R

S G A H P C Z N F Z D F W O K O D G

A E O S C X T D O E N Z H R X N I I

L N W D B G Z Q D M K O B S D O X S

P O Y K S E W E W D N D T F Q I O M

A X R B Q H S E D I R O U L F S R O

O I U F Z I N T B O I L B S B O U K

K D C W O D S M O G X A M R T R F E

H E R N Q E Z A M S K O N W A E L Z

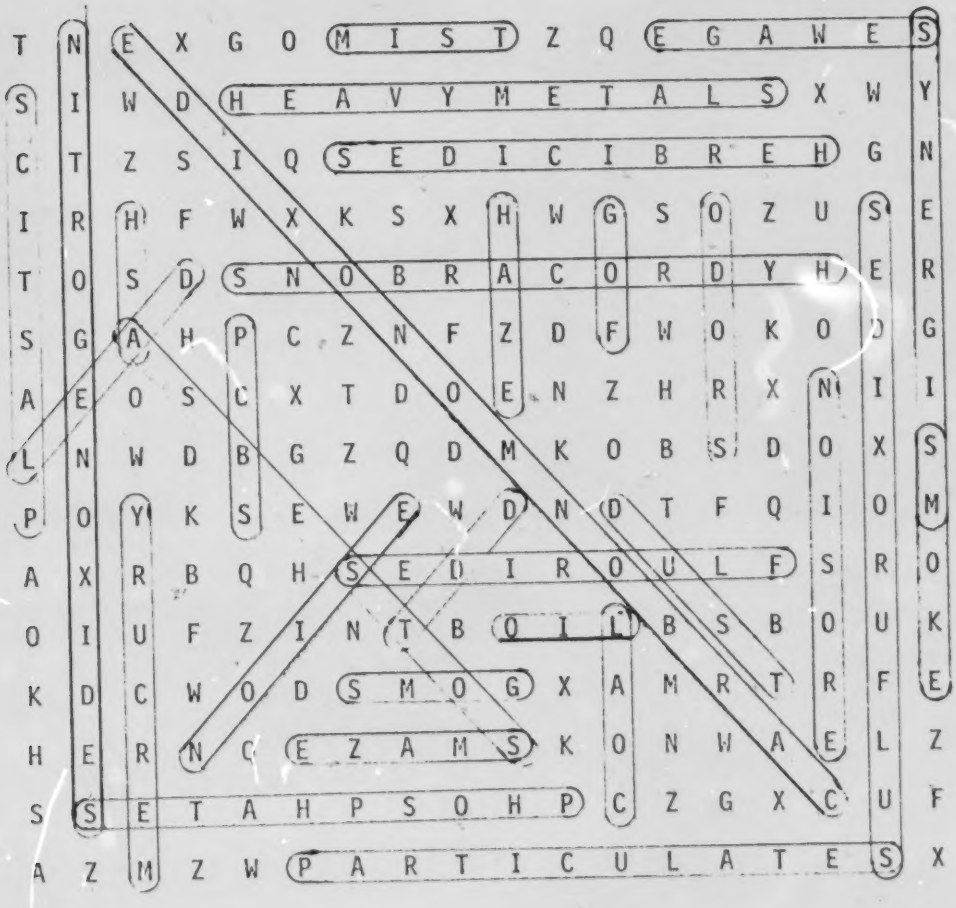
S S E T A H P S O H P C Z G X C U F

A Z M Z W P A R T I C U L A T E S X

WORDS FOR POLLUTANTS PUZZLE

1. DDT
2. Ash
3. Carbon monoxide
4. Hydrocarbons
5. Nitrogen oxides
6. Sulfur oxides
7. Particulates
8. Fluorides
9. Asbestos
10. Heavy metals
11. Fog
12. Haze
13. Smaze
14. Synergism
15. Smoke
16. Dust
17. Smog
18. PCBS
19. Mist
20. Noise
21. Herbicides
22. Coal
23. Odors
24. Mercury
25. Lead
26. Phosphates
27. Sewage
28. Erosion
29. Oil
30. Plastics

POLLUTANTS


T N E X G O M I S T Z Q E G A W E S
S I W D H E A V Y M E T A L S X W Y
C T Z S I Q S E D I C I B R E H G N
I R H F W X K S X H W G S O Z U S E
T O S D S N O B R A C O R D Y H E R
S G A H P C Z N F Z D F W O K O D G
A E O S C X T D O E N Z H R X N I I
L N W D B G Z Q D M K O B S D O X S
P O Y K S E W E W D N D T F Q I O M
A X R B Q H S E D I R O U L F S R O
O I U F Z I N T B O I L B S B O U K
K D C W O D S M O G X A M R T R F E
H E R N C E Z A M S K O N W A E L Z
S S E T A H P S O H P C Z G X C U F
A Z M Z W P A R T I C U L A T E S X

ECOLOGY PUZZLE

This puzzle could be used in a variety of ways

1. The puzzle could just be handed to the students to find any word that deal with ecology.

2. The student could be given a list of words to find in the puzzle.

3. The student might be given a list of the definitions and be told to find the word after matching them with the definitions.

4. They might be given the words and be asked to define them first and then find then on the puzzle.

NOTE: THE WORDS ARE ARRANGED ACROSS, UP, DOWN, DIAGONAL AND BACKWARD.

ECOLOGY

S X D C Y P L M E R E H P S O I B C

T F O O D C H A I N R Q N R D Z S O

N L L N E R A B I O T I C E M N E M

E O R S N L Q K M H O S T C L B I M

M C E U E U V E S B E A Z U D J C E

N K S M R D T L Z T P R N D K D E N

O V O E G S R M C B E W D O O F P S

R Z P R Y P M N C S M Q V R O L S A

I Y M S N O I T A L U P O P J M P L

V N O I K T M S I T I S A R A P Z I

N C C L X U I B L S Y M B I O S I S

E H E E Q L C T Z M S I L A U T U M

E R D P T E R R I T O R Y L S J T X

E C O L O G Y T E I C O S L O Q Z R

WORDS TO BE USED WITH ECOLOGY WORD-FIND

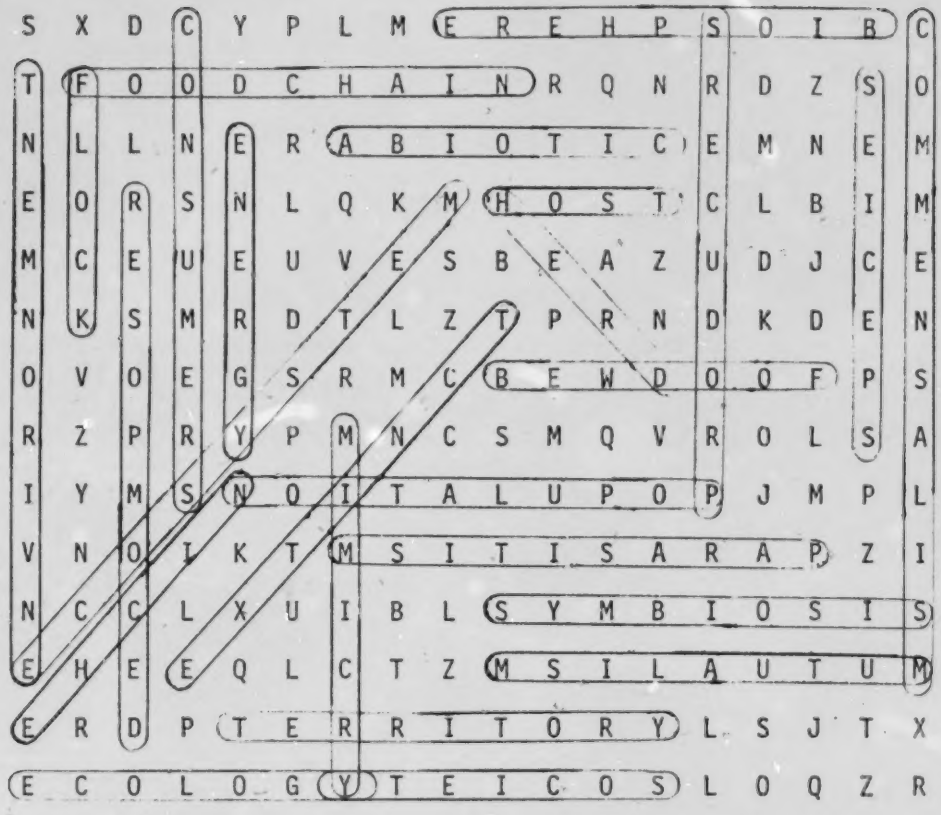
1. Food chain
2. Population
3. Producers
4. Consumers
5. Ecosystem
6. Food web
7. Decomposer
8. Mimicry
9. Symbiosis
10. Commensalism
11. Mutualism
12. Parasitism
13. Host
14. Society
15. Flock
16. Herd
17. Territory
18. Abiotic
19. Niche
20. Ecology
21. Environment
22. Biosphere
23. Species
24. Extinct
25. Energy

ECOLOGY

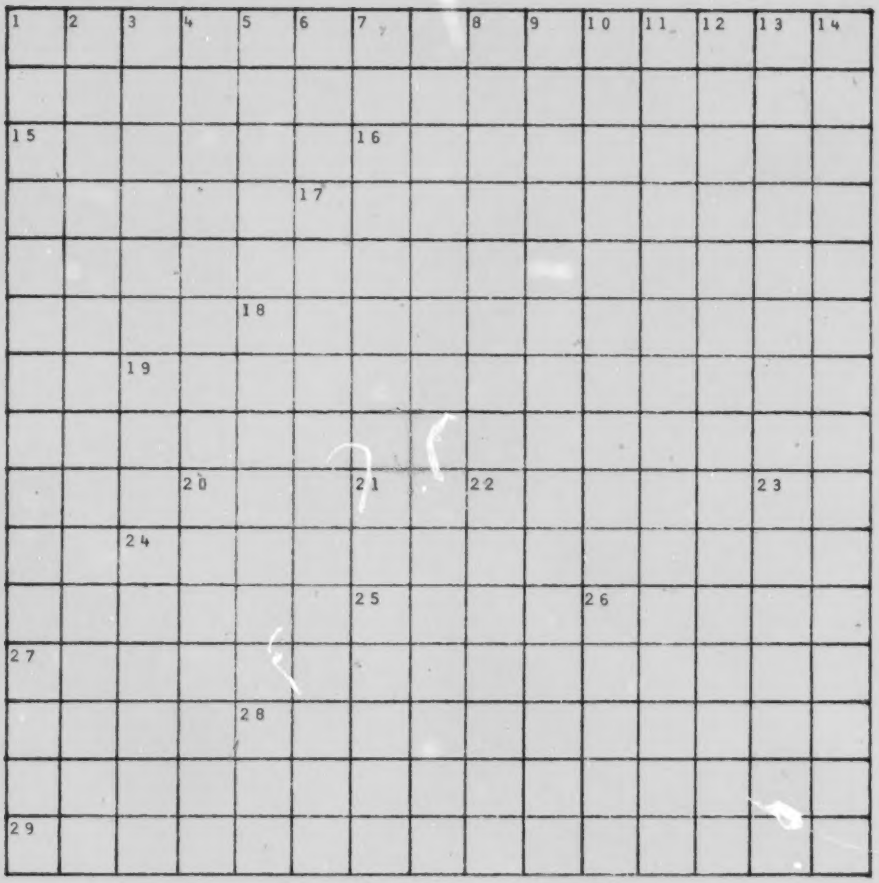
S X D C Y P L M E R E H P S O I B C
T F O O D C H A I N R Q N R D Z S O
N L L N E R A B I O T I C E M N E M
E O R S N L Q K M H O S T C L B I M
M C E U E U V E S B E A Z U D J C E
N K S M R D T L Z T P R N D K D E N
O V O E G S R M C B E W D O O F P S
R Z P R Y P M N C S M Q V R O L S A
I Y M S N O I T A L U P O P J M P L
V N O I K T M S I T I S A R A P Z I
N C C L X U I B L S Y M B I O S I S
E H E E Q L C T Z M S I L A U T U M
E R D P T E R R I T O R Y L S J T X
E C O L O G Y T E I C O S L O Q Z R

1. Food chain
2. Population
3. Producers
4. Consumers
5. Ecosystem
6. Food web
7. Decomposer
8. Mimicry
9. Symbiosis
10. Commensalism
11. Mutualism
12. Parasitism
13. Host
14. Society
15. Flock
16. Herd
17. Territory
18. Abiotic
19. Niche
20. Ecology
21. Environment
22. Biosphere
23. Species
24. Extinct
25. Energy

Ecology Answer Key


S X D C Y P L M E R E H P S O I B C
T F O O D C H A I N R Q N R D Z S O
N L L N E R A B I O T I C E M N E M
E O R S N L Q K M H O S T C L B I M
M C E U E U V E S B E A Z U D J C E
N K S M R D T L Z T P R N D K D E N
O V O E G S R M C B E W D O O F P S
R Z P R Y P M N C S M Q V R O L S A
I Y M S N O I T A L U P O P J M P L
V N O I K T M S I T I S A R A P Z I
N C C L X U I B L S Y M B I O S I S
E H E E Q L C T Z M S I L A U T U M
E R D P T E R R I T O R Y L S J T X
E C O L O G Y T E I C O S L O Q Z R

ECOLOGY



ACROSS

1. Study of the environment
8. Term given to the nonliving part of the environment
15. A jungle cat
17. Decomposed organic matter mixed with soil
19. Animals which feed on other dead animals
20. Tiny channels caused by flowing water
22. Number of organisms in a given area
25. Period of time between birth and death (2 words)
27. Physical state exhibited by water vapor

39

ACROSS
(Continued)

28. Organisms that break down tissues and excretions of other organisms

29. An inactive period during the summer months

DOWN

1. Death of an entire species

3. A complete and entire living thing

9. Entire world of living things

11. One name given to a body of water

14. All the populations in a well-defined area

16. The ultimate source of all energy

18. Living in salt water

21. A shade of purple

23. Habitat found in the polar regions

24. An area that receives less than 25 cm. of rain per year

26. Combination of smoke and fog

ECOLOGY

(Answer Key)

1 E	2 C	3 O	4 L	5 O	6 G	7 Y		8 A	9 B	10 I	11 O	12 T	13 I	14 C
X		R							I		C			O
15 T	I	G	E	R		16 S			O		E			M
I		A			17 H	U	M	U	S		A			M
N		N				N			P		N			U
C		I		18 M					H					N
T		19 S	C	A	V	E	N	G	E	R	S			I
I		M		R					R					T
O			20 R	I	L	21 L		22 D	E	N	S	I	23 T	Y
N		24 D		N		I							U	
		E		E		25 L	I	F	E	26 S	P	A	N	
27 G	A	S				A				M			D	
		E		28 D	E	C	O	M	P	O	S	E	R	S
		R								G			A	
29 E	S	T	I	V	A	T	I	O	N					

NATURAL CYCLES
(Answer Key)

CYCLES:

CARBON	NUTRIENT
NITROGEN	OXYGEN
PHOSPHORUS	

TERMS:

NITROGEN-FIXING BACTERIA	N_2
DECAY	NITRATES
AMMONIA	DENITRIFICATION
NODULES	LEGUMES
NITROGEN FIXATION	GREENHOUSE EFFECT
FOSSIL FUELS	PHOTOSYNTHESIS
RESPIRATION	PRODUCERS
PRIMARY CONSUMERS	SECONDARY CONSUMERS
DECOMPOSERS	SCAVENGERS

This is a cryptogram activity. To find the answers the students are to discover the letters that correspond to the jumbled letters. For example in this puzzle the letter X corresponds to the correct letter C.

NATURAL CYCLES

XGXTPA:

XUCIKY

YSFCKDPY

ZQKAZQKCBA

YBFCSPYF

KHGDPY

FPCEA:

YSFCKDPY-WSHSYD IUXFPCSU

MPXUG

UEEKYSU

YKMBTPA

YSFCKDPY WSHYFSKY

WKAAST WBPTA

CPAZSCUFSKY

ZCSEUCG XKYABEPCA

MPXKEZKAPGA

Y_2

YSFCUFPA

MPYSFCSWSXUFSKY

TPDBEPA

DCPPYQKBAP PWWPXF

ZQKFKAGYFQPASA

ZCKMBXPCA

APXKYMUCG XKYABETCA

AXUJPYDPCA

BIOMES ANSWER KEY

DESERT	TROPICAL RAIN FOREST
TUNDRA	TIAGA
LAKE	INTERTIDAL ZONE
GRASSLANDS	SAVANNAHS
CONIFEROUS FOREST	DECIDUOUS FOREST
SHORE LINE	OCEAN
SOIL	RIVER

This is a cryptogram activity. To find the answers the students are to discover the letters that correspond to the jumbled letters. For example in this puzzle the letter T corresponds to the correct letter D.

BIOMES

TPHPJA

AYBTJM

EMDP

LJMHHEMBTH

ZJMRJRPH

SCBRVPJCYH VCJPHA

HQCJP ERBP

HCRE

AJCZRSME JMRB VCJPHA

ARMLM

RBAPJARTME OCBP

ZEMRBH

HMKMBBMQH

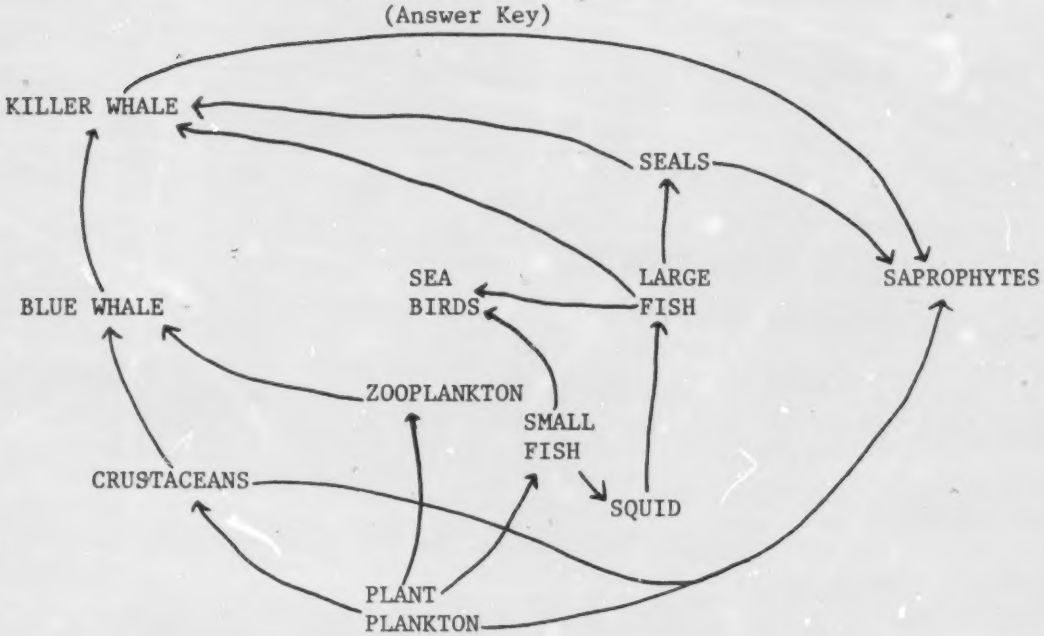
TPSRTYCYH VCJPHA

CSPMB

JRKPJ

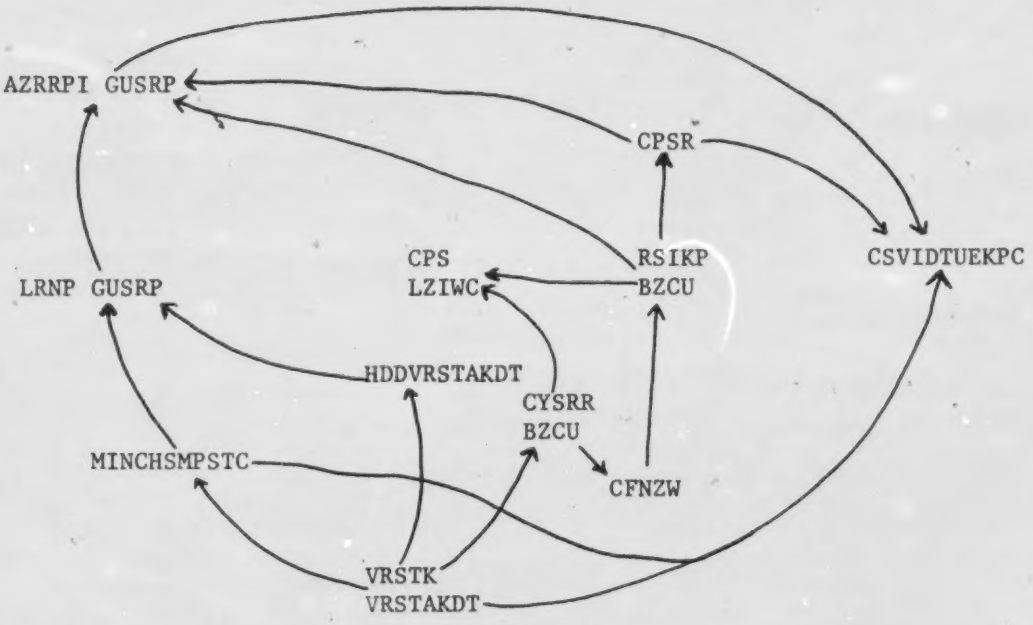
45

ANTARCTIC FOOD WEB
(Answer Key)

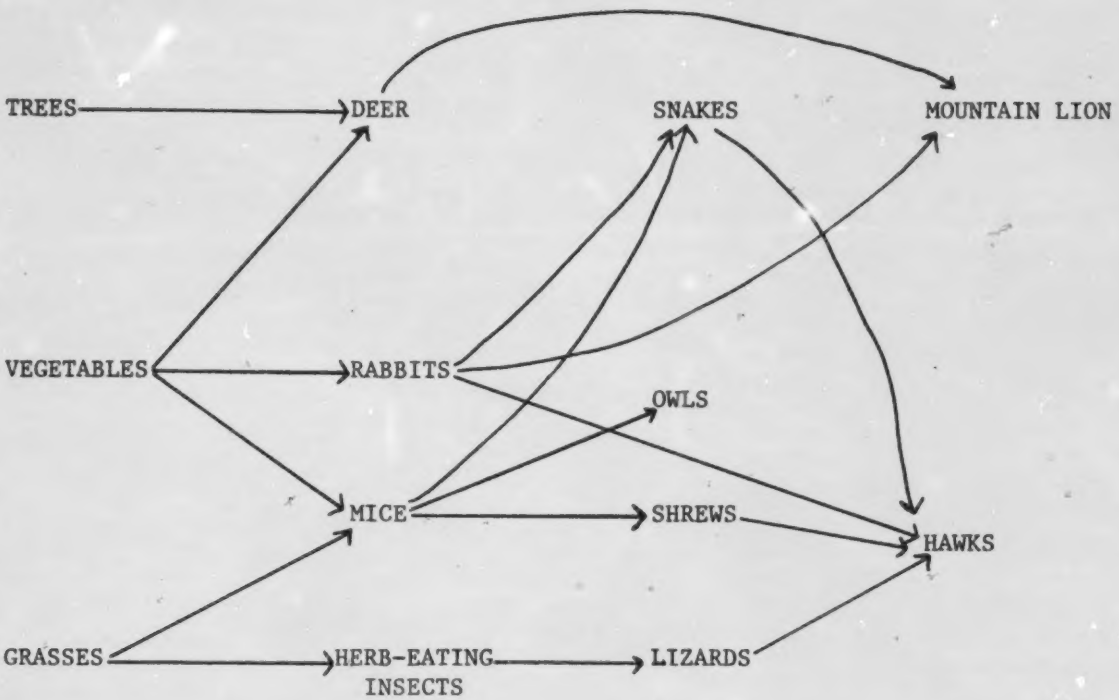


This is a cryptogram activity. To find the answers the students are to discover the letters that correspond to the jumbled letters. For example in this puzzle the letter A corresponds to the correct letter K.

ANTARCTIC FOOD WEB

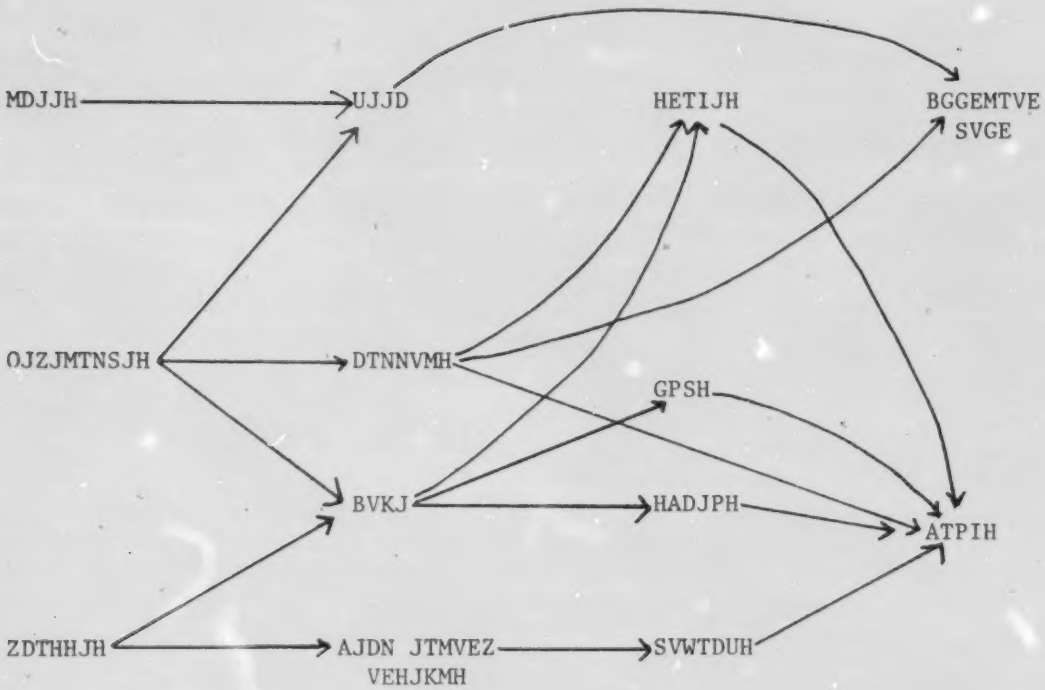


ANSWER KEY FOR TERRESTRIAL FOOD WEB



This is a cryptogram activity. To find the answers the students are to discover the letters that correspond to the jumbled letters. For example in this puzzle the letter M corresponds to the correct letter T.

TERRESTIAL FOOD WEB



HEREDITY MYSTERY

On June 12, 1964, at 12 midnight 3 children were being born at General Hospital, one to the Smith's, one to the Jones', and one to the Green's. At 12:05, a bomb went off in the hospital. The hospital burned to the ground, destroying all records, and before an ID bracelet had been attached to the wrists of the babies. All were saved but no one knew which child was which. Everyone drew straws to decide which child they would take home. Years passed. All the couples continued to have secret doubts whether or not they had chosen their own child. Suddenly, Mr. Jones, a millionaire, died of a heart attack. In his will he has left all his money to his real child, and the money cannot be touched until the mystery is solved. With your knowledge of genetics you have been called in to solve the mystery. If you can solve it, you will collect $100,000. Good luck.

Use the following clues to fill in the chart you have been given. Then decide whose child is whose.

Mrs. Jones has attached ears which show when she wears her diamond ear rings.

Gerald can roll his tongue.

Jim has a widow's peak that shows when he goes swimming.

Mr. Smith has had bent little fingers in his family for generations.

Sally is homozygous for free ears.

Mr. and Mrs. Green can roll their tongues but both had one parent who couldn't.

Mr. and Mrs. Smith found that no matter how hard they tried, they could not taste PTC.

Gerald is heterozygous for free ears.

Mrs. Jones' little finger is bent, but her father's was straight.

Mr. Jones cannot taste PTC.

Mrs. Jones' family have been tasters for generations.

Mrs. Green has attached ears but Mr. Green's family has had free ears for generations.

Mrs. Green uses her little finger as a straight edge.

Mrs. Smith thinks her widow's peak is attractive.

Mr. Jones had free ears but his mother's were attached.

Sally cannot taste PTC.

Mr. Green's finger is bent but his father had a straight one.

Mr. and Mrs. Smith have had free ears in both their families for generations.

Gerald put some PTC paper in his mouth but could not taste it.

Jim's ears are attached.

Mr. Jones' little finger was straight.

Sally tried but could not roll her tongue.

Mrs. Jones has a straight hair line.

Neither Mr. or Mrs. Green have a widow's peak.

Both Mr. and Mrs. Smith are heterozygous for tongue rolling as both their mothers could not roll.

Mr. and Mrs. Green can taste PTC paper, but both of their fathers cannot.

Gerald is a straight boy. Both his little finger and hairline are straight.

Jim practiced many hours but could not roll his tongue.

Sally is homozygous for bent little finger.

Both Mr. Jones and Mr. Smith hide their widow's peaks by combing their hair foreward. They are embarressed over them as neither of their fathers had one.

Neither Mr. or Mrs. Jones can roll their tongues, although they took lessons.

Sally has a widow's peak.

Jim has a bent finger.

Mrs. Smith has a bent finger but her mother had a straight one.

Jim can taste PTC.

TRAITS

Free earlobes - FF or Ff
Widow's Peak - WW or Ww
PTC taster - TT or Tt
Bent finger - BB or Bb
Tongue roller - RR or Rr

Attached - ff
Straight - ww
Nontaster - tt
Straight - bb
Nonroller - rr

PARENTS

	Mrs. Jones	Mr. Jones	Mrs. Green	Mr. Green	Mrs. S	Mr. S
Ears						
Hair						
PTC						
Finger						
Roll						

Children

	Gerald	Jim	Sally
Ears			
Hair			
PTC			
Finger			
Roll			
Real Parents			

Who inherited the fortune? _____

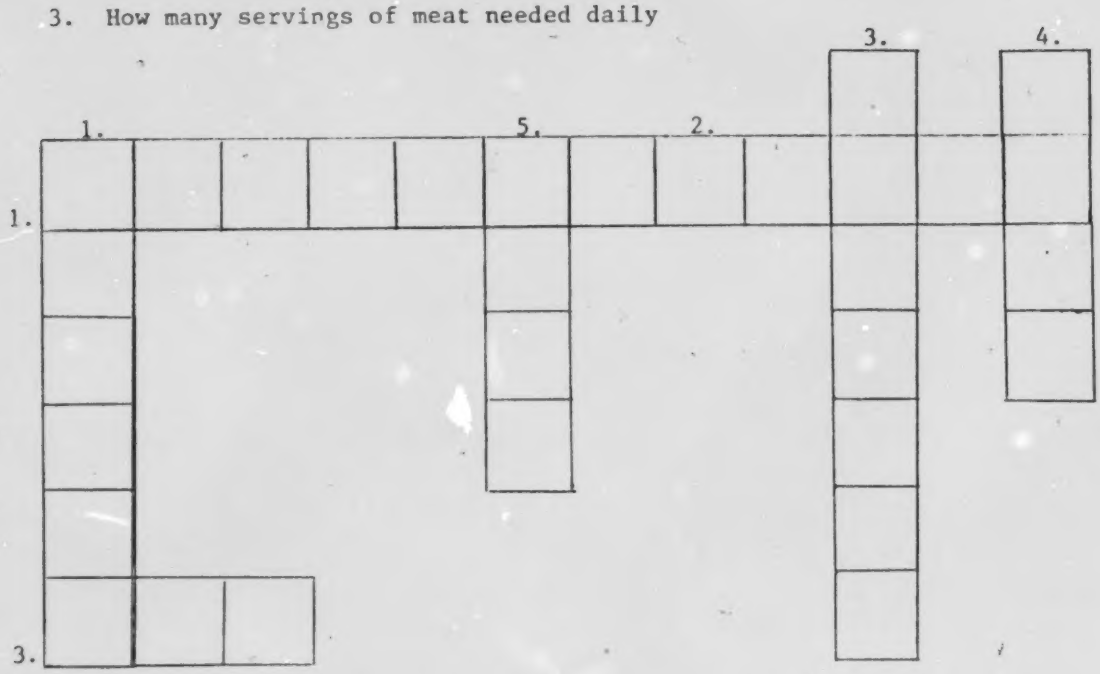
Nutrition Cross Word Puzzle

Down

1. A source for Vitamin A
2. Name of the "Sunshine" Vitamin
3. Builds strong bones and teeth
4. What food group is peanut butter in
5. Fat provides

Across

1. Sugar is a.....
2. Carrot is high in this vitamin
3. How many servings of meat needed daily



Plant Puzzle

This puzzle could be used in a variety of ways.

1. The puzzle could just be handed to the students to find any words that deal with plants.
2. The student could be given a list of words to find in the puzzle.
3. The students might be given a list of the definitions and be told to find the word after matching them with the difinitions.
4. They might be given the words and be asked to define them first and then find them on the puzzle.

Note: The words are arranged across, up and down, diagonal and backward.

PLANTS

CIRCLE THE WORDS DEALING WITH PLANTS

H	E	S	O	C	U	L	G	K	M	B	E	L	C	I	T	U	C
E	E	L	N	Q	X	W	S	I	M	R	E	D	I	P	E	J	A
R	N	X	B	K	P	H	Z	C	A	M	B	I	U	M	L	C	R
B	M	F	C	B	F	O	F	X	X	Y	L	E	M	T	D	H	O
A	F	P	O	U	C	R	R	I	A	H	T	O	O	R	L	R	T
C	E	E	R	N	R	L	G	T	A	P	T	M	Z	N	E	O	E
E	L	R	T	D	H	E	D	N	E	M	A	T	S	P	U	M	N
O	C	E	E	L	L	D	F	I	B	R	O	U	S	E	C	O	E
U	Y	N	X	E	S	T	O	M	A	T	A	Z	Z	S	O	P	J
S	C	N	L	A	U	N	N	A	M	C	X	M	G	O	P	L	O
G	I	I	L	E	L	L	A	R	A	P	P	D	T	L	L	A	X
T	R	A	C	H	E	O	P	H	Y	T	A	N	H	U	A	S	Y
C	E	L	K	D	E	C	L	I	X	A	E	G	N	L	S	T	G
V	P	L	Z	L	A	B	W	G	B	R	X	M	U	L	T	K	E
F	H	I	E	P	V	A	Y	Z	R	L	W	E	S	E	V	M	N
G	W	T	T	M	T	K	J	U	S	K	C	O	P	C	C	O	E
T	S	S	P	E	L	E	C	I	T	N	E	L	N	B	D	Z	T
J	V	I	R	L	L	X	D	V	K	G	Z	H	J	E	K	C	Q
L	O	P	X	B	E	H	Z	B	R	Y	O	P	H	Y	T	A	R

Words Used in Plant Puzzle

1. Stomata
2. Excurrent
3. Cuticle
4. Xylem
5. Tracheophyta
6. Tap
7. Bryophyta
8. Glucose
9. Carotene
10. Leucoplast
11. Pericycle
12. Cortex
13. Water
14. Cellulose
15. Lenticel
16. Whorled
17. Parallel
18. Pistil
19. Phloem
20. Node
21. Chromoplast
22. Epidermis
23. Fibrous
24. Annual
25. Herbaceous
26. Axil
27. Root hair
28. Stamen
29. Perennial
30. Bundle
31. Cambium
32. Stele
33. Sun
34. Oxygen
35. Net

Plant Definitions

1. Opening between 2 guard cells
2. Type of branching in which there is a single trunk extending through the tree as a single shaft.
3. Wax-like covering on a leaf
4. Conducting tissue used to conduct water upward
5. Phylum that includes the trees
6. Type of root system in which there is one main root
7. Phylum that includes the mosses and liverworts
8. The main end product of photosynthesis
9. Orange pigment found in plants
10. Type of plastid that stores starch
11. Root tissue that gives rise to secondary roots.
12. Main storage area in the root
13. The raw material other than CO_2 used for photosynthesis
14. Material that makes up the cell wall of a plant cell
15. Pore found in the external structure of a woody stem
16. Type of leaf arrangement in which there are more than one leaf at a particular position on the stem
17. Type of vein arrangement in which all the veins begin at the petiole and end at the apex.
18. The name given to the entire female reproductive structure in the flower
19. Type of vascular tissue that conducts food downward
20. Point of attachment of a leaf or branch on a stem
21. Type of plastid that stores carotenes and xanthophylls
22. A single-layer of cells on a root or leaf that serves as protection

23. Type of root system in which all roots are about the same size

24. Name given to a plant that lives only one year

25. Name given to plants that have soft green stems

26. Angle between the stem and a petiole

27. Extensions of the epidermal cells of the root that increase absorption area

28. Name given to the male reproductive structure in the flower

29. Name given to a plant that lives for more than 3 years

30. Type of scar on the woody stem that indicated where the vasculas tissue was

31. Tissue found between the xylem and phloem that increases the size of a root or stem

32. Another name for the central cylinder of a root

33. Source of energy for photosynthesis

34. A vital substance besides glucose produced by phopsynthesis

35. Another name for pinnate venation

FOOD GAME

A card game for all levels of reading students

1. Two or three may play

2. Choose for dealer

3. Deal 8 cards to each player. Turn up one card. Place rest of deck face down.

4. Starting at dealer's left, each player in turn draws a card. He may draw top card from deck, or the top face-up card. He discards one card face up.

5. A player may knock when he holds cards for 2 different meals. Each meal must have one food from each of the Basic Four food groups. The player lays down his hand.

6. Others check the hand. If the lpayer knocked correctly, he gets 2 points. If he did not have the correct knock, he loses one point.

7. If deck is used up and no player has knocked, turn over the face-up pack and continue.

8. The winner is the player with the most points when game is called.

9. Make cards by writing the following or other food items on index cards.

Cod Steak	Frankfurter
Corn Grits	Corn Flakes
Coke	Mustard Greens
Cowpeas	Yoghurt
Prunes	Coffee
Oatmeal	Buttermilk
Butterfinger	Avocados
White Bread	Corn Muffin
Hamburger	Tea
Pot Roast	Pretzels
Goats Milk	Cold Beer
Shredded Wheat	Coffee

LANDFORM SITUMATCH

THIS IS A LEARNING GAME FOR 1 TO 5 PLAYERS. SELECT A LANDFORM YOU ARE TO REPRESENT (LAKE, VALLEY, MOUNTAIN, PLAIN, SHORELINE). PICK A SITUATION THAT MIGHT AFFECT YOU. LIFT UP THE TAB (EACH TAB MAY BE USED ONLY ONCE PER GAME). READ THE RESULTS AND KEEP TRACK OF YOUR POINTS. THE PERSON WHOSE LAST NAME BEGINS CLOSEST TO Z GOES FIRST.

* * * * * * * * * * * * * * * * THE WINNER * * * * * * * * * * * * * * * *

0 - 4 POINTS--------NOT TO BAD
5 - 7 POINTS--------GOOD
8 -10 POINTS--------EXCELLENT
11 -13 POINTS--------SUPER
14 POINTS--------FAR OUT

Earthquake

Causes flooding when lake overflows dam - 1

Blacks a valley with a landslide - 1

Destroys a road on the plain - 1

Landslide

Erodes a mountainside - 1

Creates an earthdam for a lake - 1

Erodes the shoreline - 1

Heavy Rains

Erodes the mountains - 1

Deposits sediments on plains + 3

Cuts back the head of the valley- 1

Glaciers

Leaves Erratics on the plains - 1

Cuts beautiful deep fiords shoreline + 3

Dug & filled the Great Lakes + 3

Radio Active Elements

Causes magma to create volcanic mountains + 3

Causes laccoliths to push up dome mountains + 3

Slow Flowing River

Deposit sandbars in the river valley + 2

Slowly erodes mountains + 2

Deposits sediment for a delta on the shoreline + 2

Paved Roads

Allows for easy crossing of the mountains + 2

Lets us go far into valley to see the beauty of nature + 2

Snow & Ice

Covers lakes for ice skating + 3

Adds water to lakes when ice melts + 3

Covers plains and adds moisture + 3

Fast Flowing River

Erodes valleys - 1

Brings sediment to add to shoreline + 3

Cuts into mountains - 1

Wind

Creates soil erosion on the plain - 1

Makes waves on the lake + 3

Carves unusual forms in soft rocks in the mountains + 2

Uplifting Forces	Cold Winter
Creates moutains + 3	Causes ice to help break up rocks in mountains & valleys + 3 each
Tilts strata on the plains + 3	
Can drain a lake - 1	

Sedimentation	Gravity
Makes lakes shallow - 1	Pulls loosened rocks off valley walls - 1
Makes valleys wider + 2	Causes water to flow in valleys + 3
Increases shoreline formations + 3	Causes mountain sides to erode - 1
Builds up plains + 4	

Situmatch Learnin Games

Situmatch is a learning game for 1 to 6 students. Select an organism you are to represent (Oakseed, Euglena, Fern, Mushroom, Bacteria, Pineseed). Pick a situation that is to your advantage. Lift up the tab (each tab may be used only once during a game), read the results and keep track of your total points. The person whose last name begins nearest the letter Z goes first.

* * * * * * * * * * * The Winner * * * * * * * * * * *

0-5 Points-----Not to bad
5-7 Points-----Good
7-11 Points----Very Good
12-15 Points---Excellent
16-19 Points---Super
20-over Points-Far Out

Dog

Furnishes fertilizer for fern, mushroom, bacteria 3pts.

Eats pine and oakseeds -2pts

Cold Winter

Helps trees and ferns by long dormant season. 2pts.

All others no effect. 0pts.

Rain Moist Ground

Helps growth of fern, bacteria, Oak, Pine, Mushroom, Euglenophyta. 3pts.

Spider

Catches insects: helps Oak' Pine, fern, Mushroom. 3pts.

No effect on Euglena

Rabbit

Easts Oakseeds, ferns, and Mushrooms. -2pts.

Helps Bacteria 3pts.

No effect on others.

Barefooted Person

Helps Mushrooms like athletes foot. Bacteria and Euglena spread. 3pts.

No effect on others.

Sunny Day

Hurts Bacteria and Mushrooms. -2pts

Helps all others. 3pts

Raccon

Helps spread Euglena by drinking. 3pts

Eats Mushrooms and Oakseeds. -2pts

No effect on others.

Sandy Soil

Better growth for Pine and fern. 3pts

Too dry for mushrooms and Bacteria. -2pts

No effect on others.

High Humidity

Helps Bacteria, fern, muchroom, Eulena grow fast. 3pts

No effect on others.

Woodpecker

Makes holes in Oak and Pine for homes. -2pts

Spreads Euglena when it drinks. 3pts

No effect on others.

Toad

Eats mushrooms. -2pts

Eats insects that help all other. 3pts

Dry Summer

Hurts all. -2pts.

Low Humidity

Helps Oaks, Pine. 3pts.

Hurts fern, mushroom, Bacteria Euglena. -2pts.

Warm Winter

Hurts trees and ferns by Shorten formant seasons. -2 pts.

No effect on others. 0 pts.

Freshwater Pond

Euglena and Bacteria grows here. 3pts.

Helps ferns and Oak and Pine to get water. 3pts

No help for mushroom.

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Frog

Eats Euglena and mushroom -2pts

No effect on others. opts.

Forest Fire

Helps Pine trees seeds break dormancy. 3pts

Hurts by killing Oak, fern, Bacteria, mushroom. -2pts

Lightening

Can kill Pine and Oak and Euglena in water. -2pts

Burn leaves, kill fern, bacteria and mushrooms. -2pts

High Winds

Break limbs of Pine and Oak. -2pts

No effect on others. Opts

Ants

Spread Bacteria and Mushroom spores. 3pts

Kills Pine and Oak trees. -2pts

No effect on others.

Pig

Eats mushrooms, Pine and Oak. -2pts

All others. 2pts

Salt water Pond

Kills All. -2pts

Snow on the ground

Helps Oak, fern, mushrooms seeds to break dormancy. 3pts.

Hurts others. -2pts.

Cloudy Day

Helps fern, Bacteria, mushrooms grow. 3pts.

Hurts all others. -2pts.

Loud Noise

No proven effect on plants. Opts.

Squirrels

Hurts by eating Oak, Pine seeds and muchrooms. -2pts

Spreads Bacteria. 3pts

No effect on others.

Fish

Eats Euglenophyta. -2pts

No effect on others.

15 Biological Feud

by Ron Studdert

4 groups=equal in number

1 person in each group is the moderator

1 person is the contestant

1 group of clue givers 2-8

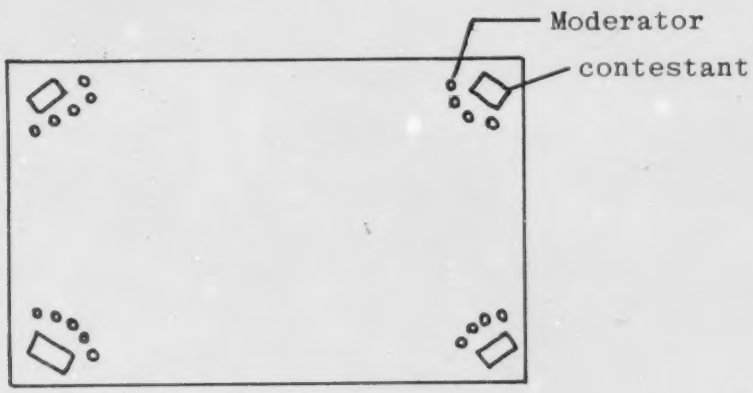
Organism to be identified is given from moderator to clue givers in each group (same word)

Groups begin upon "start" indication to give clues to contestent. Clue givers go in order. 5 seconds to give clue. Contestent must respond to each clue before the next clue giver can give his clue.

Each group works at own rate

1st contestent to get word wins points for himself and 1 point for each member of his group

Contestent becomes clue giver
Clue giver becomes contestent
New word is given and game begins anew



Clues	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Points	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

Marine Life Rummy
(2-6 players)

(This game follows the general pattern of Gin Rummy)

Objective: To "meld" 5 cards to describe one animal with one "off" as a discard, thus to associate an animal with its habitat, feeding style, locomotion, description, etc.

Deck: Each deck contains 50 cards including 2 "wild cards" which a player may declare to be any characteristic that will fit into his hand.

Rules: 1) The dealer will be the person whose last name contains the most letters.

2) The dealer will deal 5 cards to all players and 6 to himself. The remainder of "the deck" is placed face down in the center.

3) The dealer begins by discarding one card face up. The player to his left may choose the top discard or draw from the stack. This player discards one card, face up. Continue in this fashion until a player melds.

4) A player melds when five of his cards all describe the same animal. He then declares "Rummy" and shows his cards and names the organism that possesses these characteristics. The player that melds correctly receives a 10 point bonus.

5) The "melder" may be challenged if another player thinks one of his cards does not fit into the description of the designated organism. If the challenger is proved correct he collects the 10 point bonus and the original "meld" is penalized 5 points. The game ends when one player accumulates 50 points."

Marine Life Rummy

(cont.)

The deck will contain the following cards

Number of Cards	Written on Cards
1	Phylum: Chysophyta
2	Phylum: Mollusca
1	Phylum: Protozoan
1	Phylum: Echinodermata
1	Phylum: Arthropoda
4	Habitat: Benthic
2	Habitat: Pelagic
2	Locomotion: Jet Propulsion
1	Locomotion: Crawl
1	Locomotion: Tube Feet
2	Locomotion: Planktonic
1	Feeding: Carnivore
1	Feeding: Filter Feeder
2	Feeding: Ingestion
1	Feeding: Inorganic Nutrient
1	Feeding: Detritus
1	Covering: Skin
1	Covering: Bivalve Shells
1	Covering: Calcareous Test
1	Covering: Siliceous Plates
1	Covering: Leathery Plates
1	Covering: Chitonous Carapace

Marine Life Rummy

(cont.)

Number of Cards	Written on Cards
1	Substrate: Rocky
1	Substrate: Sandy
2	Substrate: Sandy or rocky
3	Euphotic Zone
2	Pelagic
1	Nekton
1	Eight Arms
1	Ten Jointed legs
1	Spiny Skin
1	Pseudo-podia
1	Ring Canal
2	Hides in Rocky Crevice
1	Prefers Warm Water
2	Prefers Cool Water
2	You Name It

Your Time Chart

Develope a mock time scale to show how geolist developed the Geo-legic time scale.

Have each student think of 1 significant event in their life.
Example-recieved their first bicycle
recieved their first shotgun
lost their first tooth
drove car first time

These correlate to significant events in say evolution of animals or formation of land forms. In other words Geologist know these events happened but not when. They fit these events into the already existing time scale, which of course gets better or more complete with time. Knowledge is built on knowledge. The more pieces that are there, the easier it is to fit in new pieces. Okay, Geologist have the benefit of certain things such as age dating (to help somewhat). We have the benefit of knowing the ages of the people at the present and the probable age they were when their special event took place. Each student states their event, the other students guess the year they think that event happened. Say years range from 1963 to 1976 (for children about 13) First child says he lost his 1st tooth, we'll say it happened when he was 6 so we'll put 1969 (VK,child's initials) on board. And add all of the other childrens events in order the best we can. (Some events may also indicate the season which can also be added.) Later we go back and find out the exact dates of the events to see how close we were.

Much discussion arises in deciding what year many things took place.

MINERAL RUMMY

Katherine Goodbar

MATERIALS:

Deck of 68 tag board cards about 6 cm X 9 cm with a mineral characteristic on each.

Deck of 6 colored tag board cards same size (Player cards). Players are Quartz Orthoclase, calcite, hematite, gypsum, galena.

THE PLAY

Each player draws a player card from the colored deck. During the play he will try to draw characteristics for the mineral that he represents.

Five cards are delt from the deck to each player. The rest of the deck is placed in the center of the table face down with one card placed face up by the side to begin the discard pile. Each player may draw a card from the deck in turn and make a discard. If a card is drawn from the discard pile, the entire discard pile must be taken. When a player has three cards with characteristics of his mineral he may lay them down face up in front of him. A player may play cards on the display that another player has put down. A player may challenge a card that another player has put down. If the challenger is correct, the player must take up the wrong card and take two more cards into his hand from the deck. In order to Rummy a player must play all of the cards in his hand and have a discard. This means that he will probably have to take a discard stack at sometime during the play. At the end of the play each player gets 5 points for each card on the table, Rummy is an additional 20 points, and the person who Rummies gets 1 point for every card that each player has still in his hand.

THE DECK

One of the following characteristics is on each card. Some characteristics are on more than one card:

Silicate	varieties are alabaster and selenite
Found in granite	penny scratches
Hardness of 7	fizzes in acid
Conchoidal fracture	3 directional cleavage
Vitreous luster	calcium carbonate
striated crystals	may be any color
rock forming mineral	may be any color
one variety is chert	tan to white when pure
makes up most beach sand	rhombohedral cleavage
white, gray, pink	rock forming mineral
Specific Gravity 2.6	abundant in Dallas
hardness of 6	chief ore of iron
$KAlSi_3O_8$	oxide mineral

THE DECK (continued)

90^{o} cleavage in 2 directions	red-brown streak
vitreous to pearly luster	metallic to earthy luster
weathers to clay minerals	specific gravity 5.26 (fairly heavy)
found in granite	hardness 5.5 - 6.5
rock forming mineral	color redish brown to black
hardness of 2	kidney ore
hydrous clacium sulfate	weathers to limonite
an evaporite	ore of lead
pearly to silky luster	cubic cleavage
white to gray when pure	metallic luster
one variety is fibrous	specific gravity 7.5 (heavy)
rock forming mineral	hardness 2.5
gray-silvery color	used in the manufacture of bullets
deposited by hydrothermal solutions	sulfide mineral
dark gray streak	cleavage in 4 directions
ore of zinc	ore of copper
hardness of 1	hardness of 4
hardness of 5	hardness of 8
greasy feel	dark purple color
apple green grains	yellow streak
cleaves in thin sheets	an amphibole
a radioactive mineral	used in making wall board

Clues to "Who Are You"

Class is divided into 2 groups seated in rows or other arrangement.

Clues are read by teacher or student.

Student #1 in each group has a chance to name 1 organism on first clue, if named on first clue the team gets 5 points. Each clue read decreases possible score by 1 point. If no team gets answer, go on to next organism.

Animals to Guess

1. Frog
   a. fresh water dweller
   b. aniphibian
   c. eyes help swallow
   d. boys croak
   e. looks like a toad

2. Rabbit
   a. land dweller
   b. mammal
   c. viviparous
   d. has long ears
   e. delivers eggs at Easter

3. Lemming
   a. tundra dweller
   b. mammal
   c. jumps off cliff when crowded
   d. looks like a rat
   e. rhymns with swimming

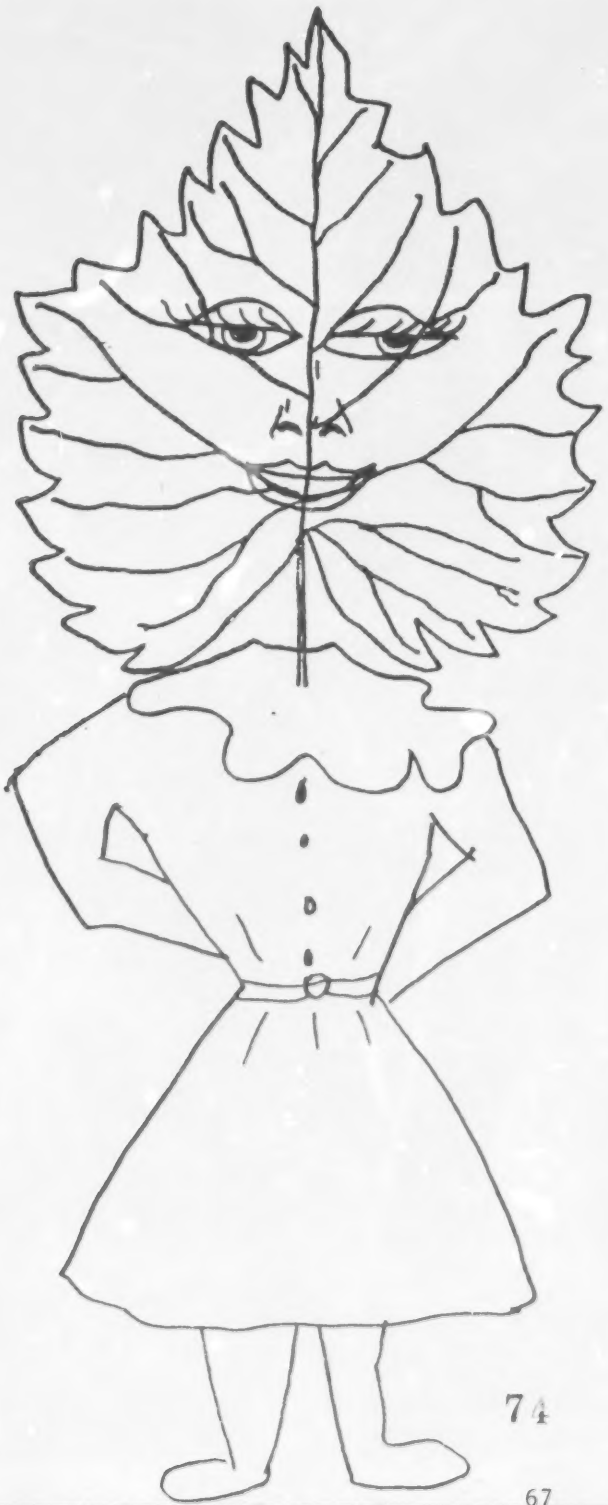
4. Prairie Dog
   a. desert dweller
   b. mammal
   c. can stand very high body temperature
   d. has a cousin in the forest
   e. lives in a "town"

5. Pine tree
   a. Lives in the forest
   b. Gymnosperm
   c. Conifer
   d. has needles
   e. we decorate it at Christmas

6. Pecan tree
   a. lives in the forest
   b. Angiosperm
   c. "nut bearer"
   d. deciduous
   e. Texas state tree

Art Project

Take leaf (any type) use to make a body of head of person. Paste to construction paper. Add remaining parts of body. Color in background.



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Forests and Forestry

13210. Write for publications list showing 67 popular and technical forestry publications. Free to teachers. Sample titles are:

Recipe for Tree Planting. 6 pp. Hints for the best way to plant a tree.

The Story of Your Christmas Tree. Rev. 1968. 6 pp. Christmas related story.

Tree Pest Leaflet Series. Rev. 1968. Twenty-two leaflets covering tree pests and diseases of New York State.

When You Are in the Woods. Rev. 1967. 42 pp. Tells how to enjoy forests.

The Forest and Our Environment. National Forest Products Assoc. 1619 Massachusetts Ave., N. W. Washington, D. C. 20036. 1970. 14 pp. Free. Discusses the environmental benefits of growing forests and the need for a balance in forests and their use.

Handbook on Conifers. Brooklyn Botanic Garden. 1000 Washington Ave. Brooklyn, N. Y. 11225. 1969. 105 pp. $1.50. Lists most satisfactory conifers for each region, discusses how to protect them from insects and disease, and provides buying information on many varieties.

Lumber and Wood Products Literature. National Forest Products Assoc. 1619 Massachusetts Ave., N. W. Washington, D. C. 20036. 1970. 32 pp. Free. A bibliography of informative literature and audio-visual materials dealing with forestry and wood products.

Papermaking. Hammermill Paper Co. P. O. Box 1440. Erie, Pa. 16512. Titles include:

From Forest Tree to Fine Papers. 1970. Leaflet. Free. Illustrates Process of papermaking.

How to Make Paper by Hand. 1-10 copies 25 cents each; 11 or more copies 15 cents each. A kit containing full instructions for making paper by hand.

Redwoods. Redwood Region Conservation Council. Rosenberg Bldg. Santa Rosa, Calif. 95404. A variety of materials on forestry, conservation, and general information on redwood trees is available free to teachers.

The Redwoods. Federal Reserve Bank of San Francisco. Administrative Services Dept. 400 Sansome St. San Francisco, Calif. 94120. 1969. 12 pp. Free. Study of the redwoods along California's northern coast.

The Southern Hardwoods. 67 pp. 25 cents. Descriptions of southern hardwoods, their characteristics, availability, and use.

Southern Pine. Southern Forest Products Assoc. P. O. Box 52468. New Orleans, La. 70150. Titles include:

The Southern Pine Story. 16 pp. Free. Tells of the many uses of the southern pine.

The South's Third Forest. 11 pp. Free. Discusses plans for growing a new forest of trees to meet the needs of the future.

Ten Lessons in Forestry. 55 pp. Free. Gives lesson plans, suggested activities, and a list of sources.

Teachers Packet. Western Wood Products Assoc. 700 Yeon Bldg. Portland, Ore. 97204. Sample title:

Our Forests and You. 1970. Single packet free to teachers. A selection of materials about forests, forest management, recreation, and various types of trees.

Trees. Southern Forest Institute. Suite 280. 1 Corporate Square, N. E. Atlanta, Ga. 30329. Single copy free. Sample titles are:

How Paper Comes From Trees. 14 pp. Tells about paper and other paper products.

Your Fabulous Friend. 14 pp. Brief story of how wood products are used every day in many ways.

FORESTS AND FORESTRY---See also: Conservation; National Parks and Monuments; Natural Resources; Nature.

California Redwood. California Redwood Assoc. 617 Montgomery St. San Francisco, Calif. 94111. Single copy free to teachers. Titles include:

Our Redwood Heritage. 12 pp. Fully illustrated comprehensive account of the coast redwood.

Teacher's Kit. Includes brochures, paperback book, booklets, posters, and data sheets about the coast redwood.

Fine Hardwoods. Fine Hardwoods Assoc. 666 Lake Shore Dr. Chicago, Ill. 60611. 1-9 copies free; 10 or more copies 10 cents each. Titles include:

Fine Furniture Woods. 24 pp. Facts about walnut, mahogany, cherry, maple, birch, oak, and some exotic species of furniture woods.

Hardwood Veneers for Architectural Interiors. 11 pp. Summarizes important factors for selection of hardwood plywood.

Forestry. American Forest Institute. 1619 Massachusetts Ave., N. W. Washington, D. C. 20036. Distributed in the United States only. Send for price list for additional copies above the free quantity. Publications on good forestry practice. Sample titles are:

Better Management Vital to Improved Timber Supply. 1970. 15 pp. Free. Discusses the problems of a stable timber supply.

Forests and Trees of the United States. Rev. 1971. Map 25" x 35". In color. Also 8-page teaching suggestions. Single copy free to teachers.

The Story of Pulp and Paper. Rev. 1969. 16 pp. Five copies free per teacher.

Forestry Activities: A Guide for Youth Group Leaders. (A1.68:457/2). Supt. of Documents. Gov't. Printing Office. Washington, D. C. 20402. 1966. 31 pp. 20 cents. Projects for all ages and types of groups.

Organism Interaction

Enclosed is a set of drawings for your use in developing student concepts and knowlege of animal interaction.

In order to acquaint students with the card you could cut out the drawings and place them on display.

A student activity would be to have the children sit in a circle, give each one a card. Each child is to then represent that animal. Asking questions about the animals life style as you go have the students hold on to a string. If you use two colors of string one for plant eaters and one for meat eaters the illustration of the food web is more dramatic. The students holding two strings are then easier to identify as being adaptable to a wide range of food choices.

You may now wish to use the Who Am I activity on the back of this page.

Educational Personnel Development
Consortium D
P.O. Box 1300
Richardson, Texas 75080

Project ESP grant # G007601990

WHO AM I

A STUDENT INVOLMENT ACTIVITY TO INCREASE STUDENT APPLICATION OF CONCEPTAL KNOWLEDGE

ATTACHED IS A SET OF PICTURES OF ORGANISMS IN THE ENVIRONMENT.

CUT THE PICTURES APART ALONG THE LINES.

TAPE THE PICTURES ON THE STUDENTS BACK.

THE STUDENT MUST ASK OTHERS QUESTIONS ABOUT WHO HE IS IN ORDER TO IDENTIFY HIMSELF.

STUDENTS MAY NOT ASK WHO THEY ARE.

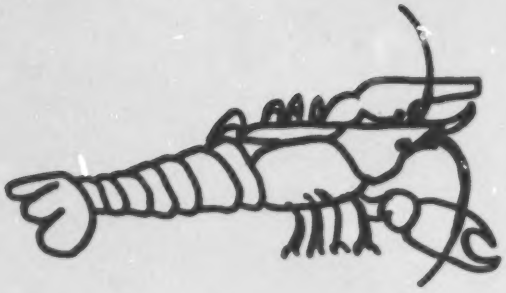
PROVIDE A LIST OF THE ORGANISMS ON THE BOARD FOR PRIMARY GRADE STUDENTS AS A HINT.

THE TEACHER SHOULD ENCOURAGE STUDENTS TO WALK AROUND AND INTERACT.

SAMPLE QUESTIONS FOR STUDENTS

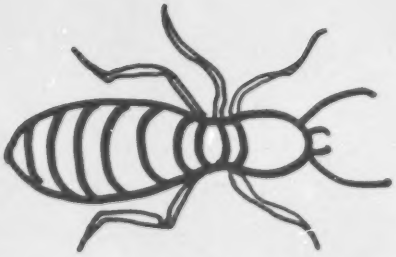
WHAT DO I EAT ?
WHEN DO I SLEEP ?
WHERE DO I SLEEP ?
CAN I FLY ?
DO I LIVE IN THE GROUND ?
DO I LIVE IN THE WATER ?

Crayfish



Squir

Termite



Drag

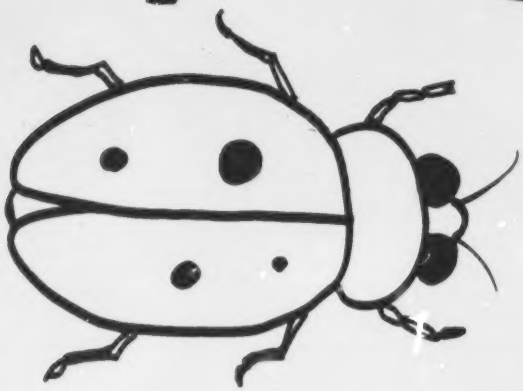
sh

Squirrel

e

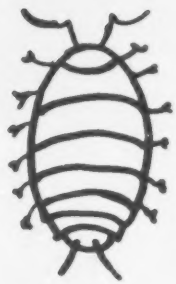
Dragonfly

Ladybug



Sna

Sow Bug



Pill Bug

A

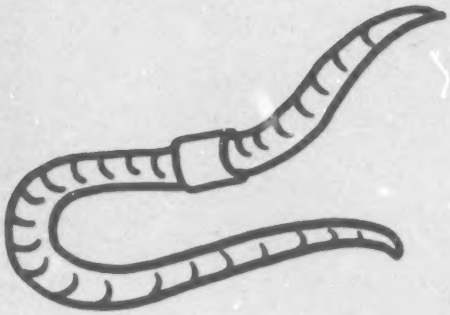
ug

Snake

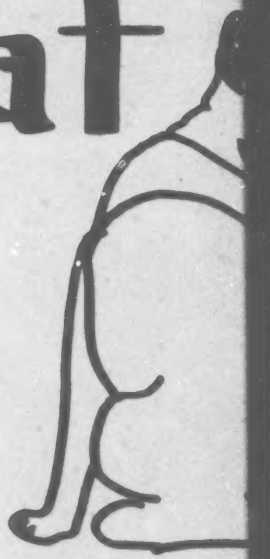
Bug

Ant

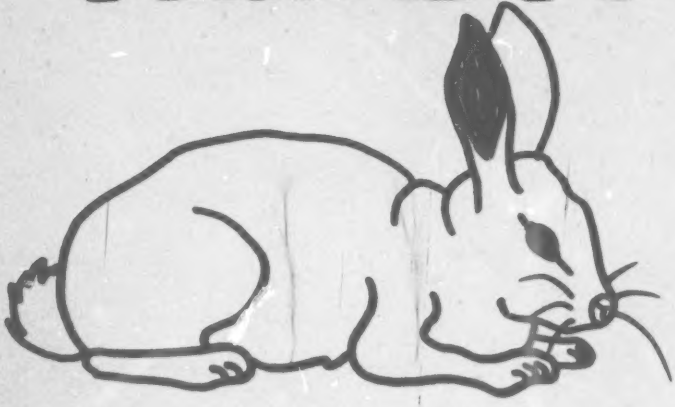
Earthworm



Cat



Rabbit



B

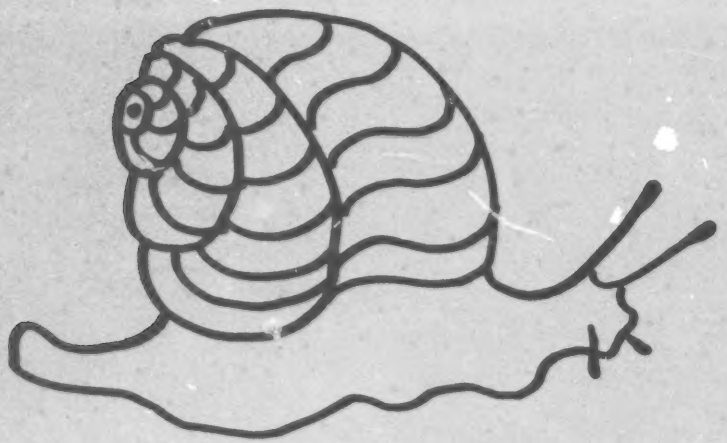
worm

Cat

bit

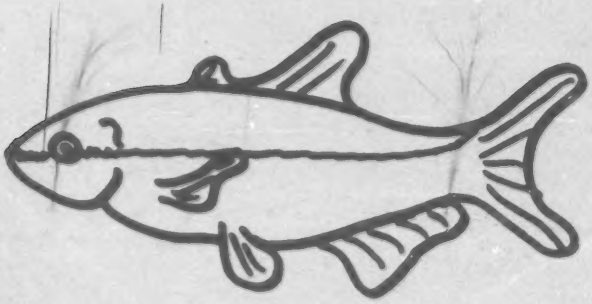
Bird

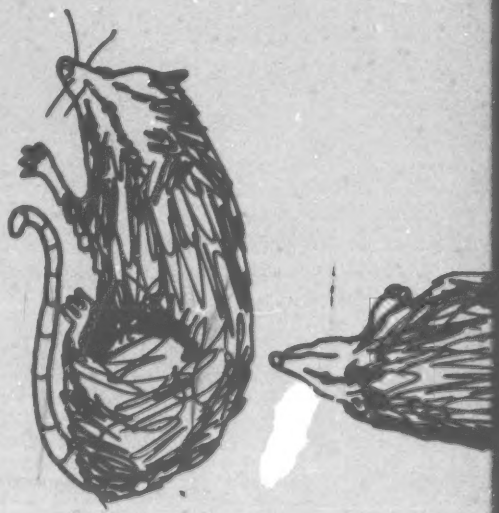
Snail



Racc

Fish

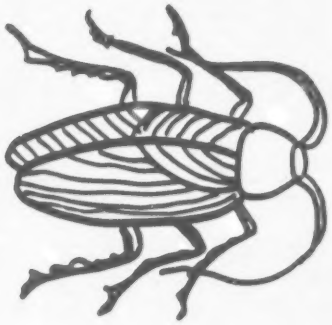




Raccoon

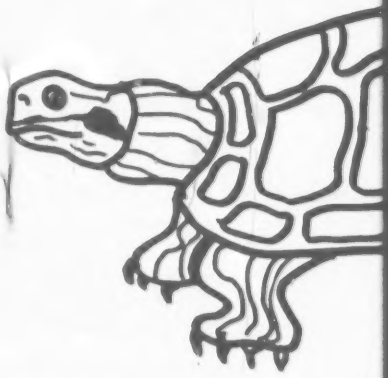
Opossum

Cockroach



Mouse

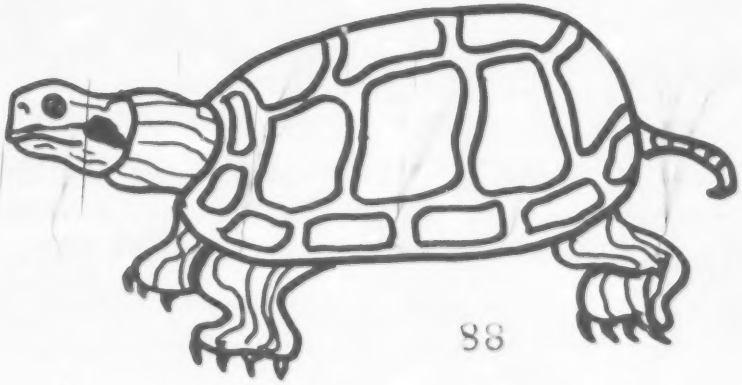
Turt



ch

Eagle

Turtle

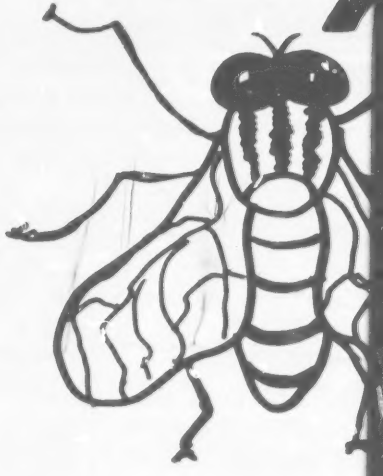


Porcupine

June

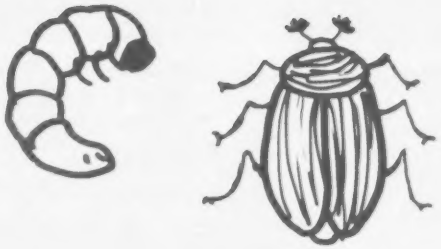
Lizard

Fly

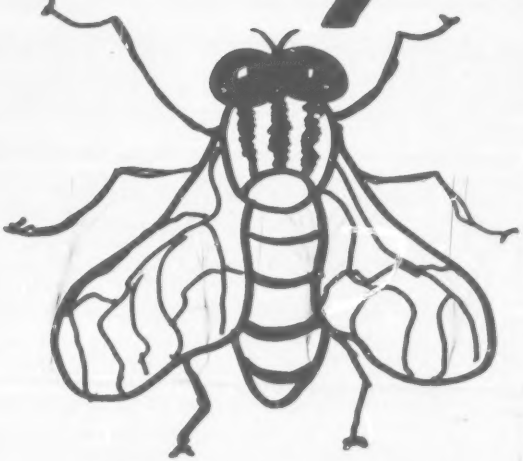


ine

June bug



Fly



Horse

Owl

Wolf

Me

Ma

Prayi

Ma

Bat

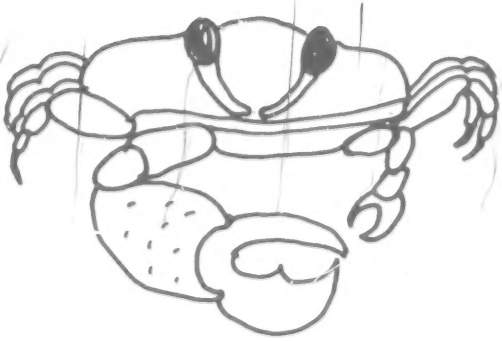
Cra

Me

Praying

Mantis

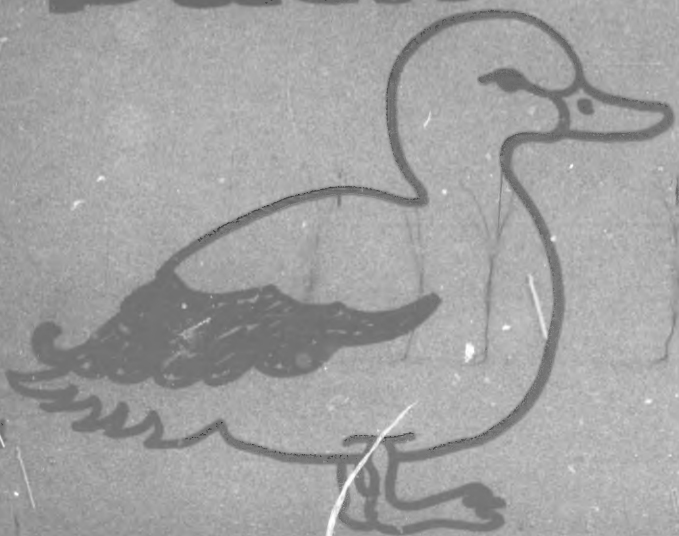
Crab



Butterfly

Grasshe

Duck



Fr

fly

Grasshopper

Frog

END